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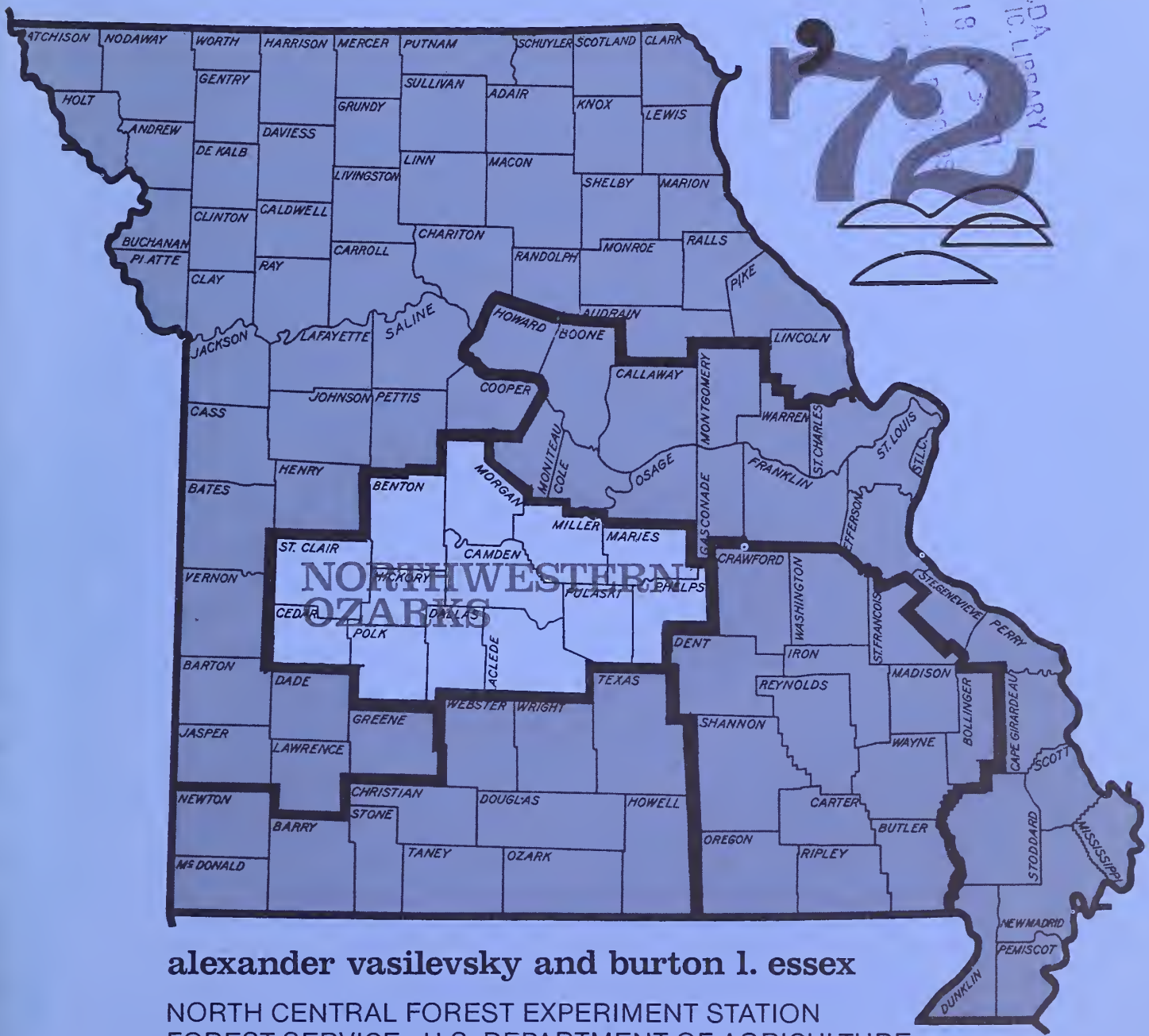
TIMBER RESOURCE OF MISSOURI'S
northwestern ozarks



alexander vasilevsky and burton l. essex

NORTH CENTRAL FOREST EXPERIMENT STATION
FOREST SERVICE • U.S. DEPARTMENT OF AGRICULTURE

North Central Forest Experiment Station
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St. Paul, Minnesota 55101
(Maintained in cooperation with the University of Minnesota)

GLOSSARY OF TERMS

Used in Resource Bulletins Reporting

MISSOURI'S 1972 TIMBER RESOURCE

NORTH CENTRAL FOREST EXPERIMENT STATION
FOREST SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Land-Use Classes

Gross area.--The entire area of land and water as determined by the Bureau of Census, 1960.

Land area.--The area of dry land and land temporarily or partially covered by water such as marshes, swamps, flood plains, streams, sloughs, and estuaries. Canals less than 1/8-mile wide, and lakes, reservoirs, and ponds smaller than 40 acres are included as land area. These figures are from the Bureau of Census, 1960.

Forest land.--Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest use. Includes afforested areas. The minimum forest area classified was 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas were classed as forest if less than 120 feet in width.

Commercial forest land.--Forest land that is producing or is capable of producing crops of industrial wood and that is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management to grow crops of industrial wood generally of a site quality capable of producing in excess of 20 cubic feet per acre of annual growth. This includes both inaccessible and inoperable areas.

Noncommercial forest land.--(a) Unproductive--forest land incapable of yielding crops of industrial wood because of adverse site conditions, (b) Productive-reserved--forest land withdrawn from commercial timber use through statute or administrative regulation, or exclusively used for Christmas tree production.

Nonforest land.--Land that has never supported forests, and land formerly forested where forest use is precluded by development for nonforest uses, such as cropland, improved pasture, residential areas, and city parks. Also includes improved roads and adjoining rights-of-way, powerline clearings, and certain areas of water classified by the Bureau of Census as land. Unimproved roads, streams, canals, and nonforest strips in forest areas must be more than 120 feet wide, and clearings in forest areas must be more than 1 acre in size, to qualify as nonforest land.

Ownership Classes

National forest.--Federal lands that have been designated by executive order or statute as national forests or purchase units, and other lands under the administration of the USDA Forest Service.

Other Federal.--Federal lands other than national forest.

State, county, and municipal.--Lands owned by States, counties, or local public agencies, or lands leased by them for more than 50 years.

Forest industry.--Lands owned by companies or individuals operating primary wood-using plants.

Farmer-owned.--Lands owned by operators of farms. A farm must include 10 or more acres from which the sale of agricultural products totals $50 or more annually, or if less than 10 acres, the yield must be at least $250 annually.

Miscellaneous private.--Privately owned lands other than forest industry- or farmer-owned.

Tree Classes

All live trees.--Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

Growing-stock trees.--All live trees of commercial species except rough and rotten trees.

Desirable trees.--Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

Acceptable trees.--Trees meeting the standards for growing stock but not qualifying as desirable trees.

Sawtimber trees.--Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer. At least 33 percent of the gross volume of the tree must be sound wood. Softwoods must be at least 9.0 inches d.b.h. and hardwoods at least 11.0 inches.

Poletimber trees.--Growing-stock trees of commercial species at least 5.0 inches d.b.h. but smaller than sawtimber size, and of good form and vigor.

Saplings.--Live trees of commercial species 1.0 to 5.0 inches d.b.h. and of good form and vigor.

Seedlings.--Live trees of commercial species less than 1.0 inch d.b.h. that are expected to survive according to regional standards. (Examples of seedlings not expected to survive are those that are diseased or heavily damaged by logging, browsing, or fire). Only softwood seedlings over 6 inches and hardwood seedlings over 1 foot in height are counted.

Rotten trees.--Live trees (any size) of commercial species that do not contain a merchantable 12-foot saw log or two noncontiguous 8-foot or longer saw logs, now or prospectively, because of rot (that is, when more than 50 percent of the cull volume of the tree is rotten).

Rough trees.--Live trees that do not contain at least one merchantable 12-foot saw log or two noncontiguous 8-foot or longer saw logs, now or prospectively, because of roughness and poor form, as well as all live noncommercial species.

Short-log (rough trees).--Sawtimber-sized trees of commercial species that contain at least one merchantable 8- to 11-foot saw log but not a 12-foot saw log.

Stocking

The degree of utilization of land by trees as measured in terms of basal area and/or the number of trees in a stand compared to the basal area and/or number of trees required to utilize fully the growth potential of the land.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees do reach 5 inches d.b.h.

Stocking of all live trees, growing-stock trees, and desirable trees are recorded separately and stands are grouped into the following stocking classes.

Stocking Classes

Overstocked stands.--Stands in which stocking of trees is 133 percent or more.

Fully stocked stands.--Stands in which stocking of trees is from 100 to 133 percent.

Medium-stocked stands.--Stands in which stocking of trees is from 60 to 100 percent.

Poorly stocked stands.--Stands in which stocking of trees is from 16.7 to 60 percent.

Nonstocked areas.--Commercial forest land on which stocking of trees is less than 16.7 percent.

Area-Condition Classes

Class 10.--Areas fully stocked with desirable trees but not overstocked.

Class 20.--Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.--Areas medium to fully stocked with desirable trees, and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.--Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.--Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.

Class 60.--Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.

Class 70.--Areas poorly stocked with desirable trees, and poorly stocked with growing-stock trees.

Stand-Size Classes

Stand.--A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

Sawtimber stands.--Stands at least 16.7 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.--Stands at least 16.7 percent stocked with growing-stock trees, and with half or more of this stocking in sawtimber and/or poletimber trees and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.--Stands at least 16.7 percent stocked with growing-stock trees and with saplings and/or seedlings comprising more than half of this stocking.

Nonstocked areas.--Commercial forest land on which stocking of growing-stock trees is less than 16.7 percent.

Other Classifications

Site index.--An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

Site classes.--A classification of forest land in terms of inherent capacity to grow crops of industrial wood expressed in cubic-foot growth per acre per year.

Stand-age.--Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

Basal area.--The area in square feet of the cross section at breast height of a single tree. When the basal area of all the trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

Forest Types

A classification of forest land based upon the species forming a plurality of live-tree stocking. Major forest types in Missouri are:

Shortleaf pine.--Forests in which shortleaf pine comprises a plurality of the stocking. (Common associates include oak, hickory, and gum.)

Eastern redcedar.--Forests in which eastern redcedar comprises a plurality of the stocking. (Common associates include oak and hickory.)

Eastern redcedar-hardwood.--Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking but in which eastern redcedar comprises 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Shortleaf pine-oak.--Forests in which upland oaks comprise a plurality of the stocking, but in which shortleaf pine comprises 25 to 50 percent of the stocking.

Post-blackjack oak.--Forests in which post oak or blackjack oak, singly or in combination, comprises a plurality of the stocking except where shortleaf pine or redcedar comprises 25 to 50 percent.

Black-scarlet oak.--Forests in which upland oaks or hickory, singly or in combination, comprises a plurality of the stocking except where shortleaf pine or redcedar comprises 25 to 50 percent, or where white oak or post and blackjack oak

comprise a plurality. (Common associates include yellow-poplar, elm, maple, and black walnut.)

White oak.--Forests in which white oak and other white oak species, singly or in combination, comprise a plurality of the stocking except where shortleaf pine or redcedar comprises 25 to 50 percent.

Oak-gum-cypress.--Bottomland forests in which bottomland oaks such as pin, swamp white, and shingle oaks, along with tupelo, blackgum, sweetgum, and cypress, singly or in combination, comprise a plurality of the stocking. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-cottonwood.--Forests in which elm, ash, or cottonwood, singly or in combination, comprises a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple.)

Cottonwood.--Forests in which cottonwood comprises a plurality of the stocking.

Maple-beech.--Forests in which hard maple or beech, singly or in combination, comprises a plurality of the stocking. (Common associates include elm and basswood.)

Timber Volume

Volume of growing stock.--The volume of sound wood in the bole of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum of 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs. Growing-stock volumes are shown in cubic feet and cords. Conversion from one unit of measure to another may be accomplished by a factor of 79 cubic feet per solid wood cord.

Volume of sawtimber.--Net volume of the saw log portion of live sawtimber trees in board feet, International 1/4-inch rule, from stump to a minimum 7 inches top diameter outside bark for softwoods and 9 inches for hardwoods.

Upper stem portion.--That part of the bole of sawtimber trees above the merchantable sawtimber top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Growth and Mortality

Net annual growth of growing stock.--Net annual growth of growing stock is the change in volume of sound wood that occurred during 1971 in growing-stock trees that were 5.0 inches d.b.h. or larger at the beginning of the year,

plus

the volume of sound wood in growing-stock trees smaller than 5.0 inches d.b.h. at the beginning of the year that grew sufficiently during the year to be reclassified into the 5.0-inch-or-larger d.b.h. classes (ingrowth),

plus

the volume of sound wood in trees that had been classified either as rough or rotten trees at the beginning of the year but were reclassified during the year as growing-stock trees,

plus

the annual change in volume of sound wood that occurred during the year on growing-stock trees that died during the year,

plus

the annual change in volume of sound wood that occurred in growing-stock trees included among timber removals for the year (See glossary for timber removals from growing stock, p. 5),

plus

the annual change in volume of sound wood in trees that had been classified as growing stock at the beginning of the year but were reclassified during the year as rough or rotten trees. Only the volume change that occurred during the portion of the years the trees were classified as growing stock was included,

minus

the volume of sound wood in growing-stock trees that died from natural causes during the year, and

minus

the volume of sound wood in trees that had been classified as growing stock at the beginning of the year, but were reclassified during the year as rough or rotten trees.

Net annual growth of sawtimber.--Net annual growth of sawtimber is the change in volume of sound wood that occurred during 1971 in trees that were sawtimber size at the beginning of the year,

plus

the volume of sound wood in growing-stock trees smaller than sawtimber size at the beginning of the year that grew sufficiently during the year to be reclassified as sawtimber trees (ingrowth),

plus

the volume of sound wood in trees that had been classified either as rough or rotten trees at the beginning of the year, but were reclassified during the year as sawtimber trees,

plus

the annual change in volume of sound wood that occurred during the year on sawtimber trees that died during the year,

plus

the annual change in volume of sound wood that occurred in sawtimber trees included among timber removals for the year (see glossary for timber removals from sawtimber, p. 5),

plus

the annual change in volume of sound wood in trees that had been classified as sawtimber trees at the beginning of the year, but were reclassified during the year as rough or rotten trees. Only the volume change that occurred during the portion of the year the trees were classified as sawtimber was included,

minus

the volume of sound wood in sawtimber trees that died from natural causes during the year, and

minus

the volume of sound wood in trees that had been classified as sawtimber trees at the beginning of the year, but were reclassified during the year as rough or rotten trees.

Mortality of growing stock.--The volume of sound wood in growing-stock trees dying annually from natural causes. Natural causes include fire, insects, disease, animal damage, weather, and suppression.

Mortality of sawtimber.--The net board-foot volume of sawtimber trees dying annually from natural causes.

Timber Removals

Timber removals from growing stock.--The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals (see glossary for volume of growing stock, p. 4). Roundwood products are logs, bolts, or other round sections cut and used from trees. Logging residues are the unused portions of cut trees plus unused trees killed by logging. Other removals are growing-stock trees removed but not utilized for products or trees left standing but "removed" from the commercial forest land classification by land use change--examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

Timber removals from sawtimber.--The net board-foot volume of live sawtimber trees removed for forest products annually (including roundwood products and logging residues) and for other removals (see glossary for volume of sawtimber, p. 4).

Timber products output.--All timber products cut from roundwood, and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees,

cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulp chips or other products.

Plant byproducts.--Wood products, such as pulpwood chips, obtained incidental to production of other manufactured products.

Plant residues.--Wood materials from manufacturing plants not utilized for some product.

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Vasilevsky, Alexander, and Burton L. Essex.
1974. Timber resource of Missouri's Northwestern Ozarks, 1972. North Cent. For. Exp. Stn., St. Paul, Minn. 59 p. (USDA For. Serv. Resour. Bull. NC-22)

The third timber inventory of Missouri's Northwestern Ozarks Forest Survey Unit shows substantial gains in both growing-stock and sawtimber volumes between 1959 and 1972. The area of commercial forests declined during the same period. Presented are highlights and statistics on forest area and timber volume, growth, mortality, ownership and use in 1972.

OXFORD: 524.1:905.2(778). KEY WORDS: Timber volume, growth, utilization, forest areas.

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FOREWORD

Forest Survey is a continuing endeavor as mandated by the McSweeney-McNary Forest Research Act of 1928. Its objective is to inventory periodically the Nation's forest lands to determine their extent, condition, and volumes of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are charged with the responsibility for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Forest Survey work done in Michigan, Wisconsin, Minnesota, North Dakota, eastern South Dakota, Nebraska, Iowa, Illinois, Indiana, Missouri, and Kansas.

Fieldwork for the 1972 Missouri Forest Survey was started in January 1970 and was completed in May 1973. Reports on the two previous surveys of Missouri's timber resource are dated 1947 and 1959. These earlier reports provide a basis for comparison with the information in this report for those interested in trends that have developed over the past quarter century.

Similar Resource Bulletins reporting statistical highlights and detailed tables on the timber resource of the other Survey Units in Missouri (see cover) are in preparation. These will provide the basis for a comprehensive analysis of the timber resource of the entire State which will be published as a separate report.

A higher degree of accuracy of survey information was obtained during the 1972 survey than otherwise would have been feasible because of intensified field sampling made possible by extra funding provided the North Central Station by the State Legislature through the Missouri Department of Conservation. The Department also conducted a canvass of primary wood-using plants in the State, which was used to help in estimating the quantity of timber products harvested in Missouri.

Personnel from the National Forests in Missouri installed sample plots on national forest lands, which were used to inventory those lands. The USDA Agricultural Stabilization and Conservation Service and the State Historical Society of Missouri furnished aerial photos used in the survey.

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N O T E

- References to information concerning growth, mortality, and removals are dated 1971, but information concerning forest area and timber inventory incorporate changes that occurred during calendar year 1971; therefore, they represent conditions as of January 1, 1972 and are dated 1972.

- Many of the terms used in this Resource Bulletin have specialized meanings, which are defined in "Glossary of Terms used in Resource Bulletins Reporting Missouri's 1972 Timber Resource." Copies of this Glossary can be obtained from the North Central Forest Experiment Station.

TIMBER RESOURCE OF MISSOURI'S NORTHWESTERN OZARKS, 1972

Alexander Vasilevsky and Burton L. Essex

HIGHLIGHTS[1/]

Forest Area

Forest land occupies 2.1 million acres (41 percent of the Unit's land area), as compared to 2.3 million acres (45 percent) in 1959.

Of this, 1.9 million acres are classified as commercial forest land as compared to 2.1 million acres in 1959.

Camden and Phelps Counties contain the Unit's largest areas of commercial forest (each having 213 thousand acres), followed by Laclede County (195 thousand acres).

The post-blackjack oak forest type (636 thousand acres) and black-scarlet oak type (630 thousand acres) dominate the commercial forest. In 1959 the post-blackjack oak type ranked third (489 thousand acres) and the black-scarlet oak type first (663 thousand acres). Nonstocked areas ranked second (649 thousand acres).

Poletimber stands make up the largest stand-size class, covering 39 percent of the commercial area, followed by sawtimber stands (30 percent), sapling and seedling stands (21 percent), and nonstocked areas (10 percent).

Farmers, private individuals, and corporations not directly engaged in timber processing own 91 percent of the commercial forest area.

Fifty-seven percent of the commercial area contains stands less than 50 years of age.

Timber Volume

Volume of growing stock increased from 626 million cubic feet in 1959 to 679 million in 1972.

Sawtimber volume gained from 1.3 billion board feet in 1959 to 1.6 billion in 1972.

Oak species account for 82 percent of the growing-stock volume.

Volume per acre of growing stock averaged 354 cubic feet (4.5 cords) in 1972, as compared to 292 cubic feet (3.7 cords) in 1959.

Farmers, private individuals, and corporations not directly engaged in timber processing own 89 percent of the volume of growing stock.

Volume in living rough and rotten trees is 526 million cubic feet (3.5 cords per acre), most of which is in rough trees.

1/ Published 1959 statistics have been adjusted to be comparable with 1972 data because of changed definitions and procedures used during the two surveys.

Short-log trees account for 78 million cubic feet of the total rough and rotten tree volume.

Stand Conditions

The net annual growth on growing-stock trees totaled 17 million cubic feet (212 thousand cords) in 1971.

The growth rate of growing stock was 2.5 percent of inventory volume.

Mortality of growing-stock trees in 1971 amounted to 739 thousand cubic feet (9 thousand cords), which principally was attributed to disease.

Three-fourths of the commercial forest area is not capable of growing 50 cubic feet or more of wood per acre per year.

Fifty-seven percent of the commercial forest contains stands less than 50 years old.

Two-thirds of the commercial forest is capable of growing trees 50 feet and taller at age 50, but only 10 percent is capable of growing trees 70 feet and taller at the same age.

Seventy-five percent of the commercial forest is poorly stocked with growing-stock trees, but only 10 percent is nonstocked with them. (See glossary for nonstocked areas, page 2.)

Timber Use

Growing-stock removals totaled 13 million cubic feet (160 thousand cords) in 1971, compared to growing-stock net annual growth of 17 million cubic feet (212 thousand cords) (see glossary for timber removals, page 5).

Forty-one percent of the volume of growing-stock removals is classed as "other" removals; therefore, it is not utilized (see glossary for timber removals, page 5).

The output of timber products in 1969 amounted to 15 million cubic feet; principally as fuelwood (33 percent), charcoal wood (30 percent), and saw logs (26 percent).

The volume of primary plant residues in 1969 totaled 1.1 million cubic feet, of which 35 percent is not used.2/

Allowable Cut

Average annual allowable cut from growing stock for the period 1972-1981 is estimated to be 17 million cubic feet (215 thousand cords)--16 million cubic feet from harvest cuttings and 1 million cubic feet from thinnings.

During the same period, an additional annual allowable cut from rough and rotten trees (nongrowing stock) is estimated to be 11 million cubic feet (143 thousand cords).

TABLES

Area:

1. Area of land by land class, 1959 and 1972.

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3. Area of commercial forest land for Missouri's Northwestern Ozarks Survey Unit and for individual counties within Unit, by forest type and stand-size class.

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7. Area of commercial forest land, by site and ownership class.

8. Area of commercial forest land, by forest type and ownership class.

9. Area of commercial forest land, by forest type and stand-age class.

10. Area of commercial forest land, by forest type and site index class.

2/ Primary plants are those using logs and bolts or chips, shavings, etc., from logs and bolts.

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35. Timber removals from growing stock and sawtimber on commercial forest land, by species and county.

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43. Average annual allowable cut of growing stock for 1972-1981, from harvest cuttings and thinnings on commercial forest land, by species and forest type.

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48. Average annual allowable cut of sawtimber for 1972-1981, from harvest cuttings and thinnings on commercial forest land, by species and stand-volume class.

49. Average annual allowable cut by harvest cuttings of sawtimber for 1972-1981 on commercial forest land, by species and stand-volume class.

50. Average annual allowable cut by thinnings of sawtimber for 1972-1981 on commercial forest land, by species and stand-volume class.

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52. Area of allowable cut by thinnings on commercial forest land for 1972-1981, by forest type and stand-age class.

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53. Sampling errors for estimates smaller than unit totals of volume, net growth, and removals, and of area of commercial forest land.

54. Forest type, site index, and rotation age by management objective used in calculation of annual allowable cut, Missouri.

Table 1.--*Area of land by land class, Northwestern Ozarks, Missouri, 1959 and 1972*

(Thousand acres)

Land class	1959[1/]	1972
Commercial forest land:		
Eastern redcedar type	0.70	4.00
Eastern redcedar-hardwood type	15.16	38.50
Post-blackjack oak type	489.01	636.00
Black-scarlet oak type	663.45	630.50
White oak type	226.22	338.90
Elm-ash-cottonwood type	91.33	64.10
Maple-beech type	11.10	11.10
Nonstocked	649.29	196.90
Subtotal	2,146.26	1,920.00
Noncommercial forest land:		
Unproductive	116.58	77.40
Productive-reserved	14.70	73.60
Subtotal	131.28	151.00
Nonforest land	2,781.14	2,958.50
Total	5,058.68	5,029.50

1/ Figures have been adjusted from those published previously for 1959 to conform to 1972 land classes because of changes in survey definitions and procedures.

Table 2.--*Area of land and forest land, by county, Northwestern Ozarks, Missouri, 1972*

County	Land area	Forest land			Commercial forest as a percent of land area
		All forest	Noncommercial	Commercial	
	Thousand acres				Percent
Benton	470.5	200.2	33.6	166.6	35
Camden	409.6	230.9	17.6	213.3	52
Cedar	317.4	81.1	8.9	72.2	23
Dallas	343.7	131.2	5.0	126.2	37
Hickory	254.0	108.0	8.0	100.0	39
Laclede	492.8	204.2	9.0	195.2	40
Maries	335.8	143.6	6.5	137.1	41
Miller	384.0	165.4	13.0	152.4	40
Morgan	379.0	166.7	4.5	162.2	43
Phelps	433.3	221.1	8.4	212.7	49
Polk	410.9	87.1	3.7	83.4	20
Pulaski	352.3	183.5	7.9	175.6	50
St. Clair	446.2	148.0	24.9	123.1	28
All counties	5,029.5	2,071.0	151.0	1,920.0	38

Table 3.--*Area of commercial forest land for Missouri's Northwestern Ozarks Survey Unit and for individual counties within Unit, by forest type and stand-size class, 1972*

(Thousand acres)

Forest type	All stands	Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas
ALL COUNTIES					
Eastern redcedar	4.0	--	4.0	--	--
Eastern redcedar-hardwood	38.5	.8	--	37.7	--
Post-blackjack oak	636.0	134.9	344.6	156.5	--
Black-scarlet oak	630.5	249.4	239.6	141.5	--
White oak	338.9	134.8	163.6	40.5	--
Elm-ash-cottonwood	64.1	52.7	--	11.4	--
Maple-beech	11.1	--	--	11.1	--
Nonstocked 1/	196.9	--	--	--	196.9
All forest types	1,920.0	572.6	751.8	398.7	196.9
BENTON COUNTY					
Eastern redcedar	.2	--	.2	--	--
Eastern redcedar-hardwood	3.1	--	--	3.1	--
Post-blackjack oak	52.5	12.6	27.9	12.0	--
Black-scarlet oak	54.2	23.1	19.5	11.6	--
White oak	29.7	12.5	13.7	3.5	--
Elm-ash-cottonwood	7.5	6.0	--	1.5	--
Maple-beech	1.1	--	--	1.1	--
Nonstocked 1/	18.3	--	--	--	18.3
All forest types	166.6	54.2	61.3	32.8	18.3
CAMDEN COUNTY					
Eastern redcedar	.7	--	.7	--	--
Eastern redcedar-hardwood	4.3	--	--	4.3	--
Post-blackjack oak	69.3	15.7	38.1	15.5	--
Black-scarlet oak	72.4	28.8	25.6	18.0	--
White oak	37.6	15.5	17.9	4.2	--
Elm-ash-cottonwood	5.0	4.2	--	.8	--
Maple-beech	1.5	--	--	1.5	--
Nonstocked 1/	22.5	--	--	--	22.5
All forest types	213.3	64.2	82.3	44.3	22.5
CEDAR COUNTY					
Eastern redcedar-hardwood	1.5	--	--	1.5	--
Post-blackjack oak	22.1	5.6	11.4	5.1	--
Black-scarlet oak	23.4	10.0	8.2	5.2	--
White oak	12.4	5.4	5.6	1.4	--
Elm-ash-cottonwood	3.6	3.1	--	.5	--
Maple-beech	.5	--	--	.5	--
Nonstocked 1/	8.7	--	--	--	8.7
All forest types	72.2	24.1	25.2	14.2	8.7
DALLAS COUNTY					
Eastern redcedar-hardwood	2.9	.4	--	2.5	--
Post-blackjack oak	40.2	9.4	21.5	9.3	--
Black-scarlet oak	41.7	17.2	15.2	9.3	--
White oak	22.3	9.3	10.4	2.6	--
Elm-ash-cottonwood	4.9	4.4	--	.5	--
Maple-beech	.8	--	--	.8	--
Nonstocked 1/	13.4	--	--	--	13.4
All forest types	126.2	40.7	47.1	25.0	13.4

1/See glossary for stand-size classes (page 3). (Table 3 cont. on next page)

(Table 3 cont.)

Forest type	All stands	Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas
HICKORY COUNTY					
Eastern redcedar-hardwood	1.9	--	--	1.9	--
Post-blackjack oak	31.7	7.6	16.8	7.3	--
Black-scarlet oak	33.2	14.1	12.0	7.1	--
White oak	17.9	7.4	8.3	2.2	--
Elm-ash-cottonwood	4.1	3.8	--	.3	--
Maple-beech	.6	--	--	.6	--
Nonstocked 1/	10.6	--	--	--	10.6
All forest types	100.0	32.9	37.1	19.4	10.6
LACLEDE COUNTY					
Eastern redcedar	.4	--	.4	--	--
Eastern redcedar-hardwood	4.5	.4	--	4.1	--
Post-blackjack oak	67.8	12.7	35.8	19.3	--
Black-scarlet oak	62.9	24.3	23.4	15.2	--
White oak	33.5	13.3	16.3	3.9	
Elm-ash-cottonwood	5.0	3.8	--	1.2	--
Maple-beech	1.0	--	--	1.0	--
Nonstocked 1/	20.1	--	--	--	20.1
All forest types	195.2	54.5	75.9	44.7	20.1
MARIES COUNTY					
Eastern redcedar-hardwood	3.3	--	--	3.3	--
Post-blackjack oak	48.6	8.9	27.7	12.0	--
Black-scarlet oak	45.2	14.6	18.9	11.7	--
White oak	24.3	8.9	12.3	3.1	--
Elm-ash-cottonwood	3.1	1.9	--	1.2	--
Maple-beech	.5	--	--	.5	--
Nonstocked 1/	12.1	--	--	--	12.1
All forest types	137.1	34.3	58.9	31.8	12.1
MILLER COUNTY					
Eastern redcedar-hardwood	3.0	--	--	3.0	--
Post-blackjack oak	50.6	10.3	28.4	11.9	--
Black-scarlet oak	48.8	18.9	19.3	10.6	--
White oak	27.8	10.9	13.5	3.4	--
Elm-ash-cottonwood	5.7	4.6	--	1.1	--
Maple-beech	.8	--	--	.8	--
Nonstocked 1/	15.7	--	--	--	15.7
All forest types	152.4	44.7	61.2	30.8	15.7
MORGAN COUNTY					
Eastern redcedar	.5	--	.5	--	--
Eastern redcedar-hardwood	2.5	--	--	2.5	--
Post-blackjack oak	53.5	12.8	29.0	11.7	--
Black-scarlet oak	55.5	23.7	21.7	10.1	--
White oak	30.3	11.4	14.9	4.0	--
Elm-ash-cottonwood	3.7	3.2	--	.5	--
Maple-beech	1.0	--	--	1.0	--
Nonstocked 1/	15.2	--	--	--	15.2
All forest types	162.2	51.1	66.1	29.8	15.2

1/See glossary for stand-size classes (page 3)

(Table 3 cont. on next page)

(Table 3 cont.)

Forest type	All stands	Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas
PHELPS COUNTY					
Eastern redcedar	1.1	--	1.1	--	--
Eastern redcedar-hardwood	3.7	--	--	3.7	--
Post-blackjack oak	76.1	13.3	41.6	21.2	--
Black-scarlet oak	71.9	26.8	30.1	15.0	--
White oak	37.8	13.8	19.4	4.6	--
Elm-ash-cottonwood	3.4	2.4	--	1.0	--
Maple-beech	1.0	--	--	1.0	--
Nonstocked 1/	17.7	--	--	--	17.7
All forest types	212.7	56.3	92.2	46.5	17.7
POLK COUNTY					
Eastern redcedar	1.1	--	1.1	--	--
Eastern redcedar-hardwood	1.9	--	--	1.9	--
Post-blackjack oak	25.5	5.3	14.3	5.9	--
Black-scarlet oak	25.4	10.1	9.6	5.7	--
White oak	13.9	5.5	6.8	1.6	--
Elm-ash-cottonwood	4.5	3.9	--	.6	--
Maple-beech	.5	--	--	.5	--
Nonstocked 1/	10.6	--	--	--	10.6
All forest types	83.4	24.8	31.8	16.2	10.6
PULASKI COUNTY					
Eastern redcedar-hardwood	3.5	--	--	3.5	--
Post-blackjack oak	60.9	11.6	32.8	16.5	--
Black-scarlet oak	57.7	21.3	22.5	13.9	--
White oak	30.2	11.6	15.0	3.6	--
Elm-ash-cottonwood	5.2	4.4	--	.8	--
Maple-beech	1.0	--	--	1.0	--
Nonstocked 1/	17.1	--	--	--	17.1
All forest types	175.6	48.9	70.3	39.3	17.1
ST. CLAIR COUNTY					
Eastern redcedar-hardwood	2.4	--	--	2.4	--
Post-blackjack oak	37.2	9.1	19.3	8.8	--
Black-scarlet oak	38.2	16.5	13.6	8.1	--
White oak	21.2	9.3	9.5	2.4	
Elm-ash-cottonwood	8.4	7.0	--	1.4	--
Maple-beech	.8	--	--	.8	--
Nonstocked 1/	14.9	--	--	--	14.9
All forest types	123.1	41.9	42.4	23.9	14.9

1/See glossary for stand-size classes (page 3)

Table 4.--*Area of commercial forest land, by county and ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

County	All ownerships	National Forest	Other federal	State, county and municipal	Forest industry	Farmer and miscellaneous private
Benton	166.6	--	--	.9	.4	165.3
Camden	213.3	--	--	--	--	213.3
Cedar	72.2	--	--	.3	--	71.9
Dallas	126.2	--	--	1.6	--	124.6
Hickory	100.0	--	--	--	--	100.0
Laclede	195.2	25.5	.8	1.7	.1	167.1
Maries	137.1	--	--	.3	--	136.8
Miller	152.4	--	--	--	--	152.4
Morgan	162.2	--	--	.9	--	161.3
Phelps	212.7	50.6	--	.2	.2	161.7
Polk	83.4	--	--	.5	--	82.9
Pulaski	175.6	38.0	41.2	.2	--	96.2
St. Clair	123.1	--	--	1.9	--	121.2
All counties	1,920.0	114.1	42.0	8.5	.7	1,754.7

Table 5.--*Area of commercial forest land, by stand-volume and ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Stand volume per acre[1/] (board feet)	All ownerships	National Forest	Other federal	State, county and municipal	Forest industry	Farmer and miscellaneous private
Less than 1,500	1,583.2	78.1	33.6	8.5	.7	1,462.3
1,500 to 5,000	320.8	36.0	8.4	--	--	276.4
More than 5,000	16.0	--	--	--	--	16.0
All classes	1,920.0	114.1	42.0	8.5	.7	1,754.7

1/ International 1/4-inch rule.

Table 6.--*Area of commercial forest land, by area-condition and ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Area-condition class[1/]	All ownerships	National Forest	Other federal	State, county and municipal	Forest industry	Farmer and miscellaneous private
50	11.0	--	5.8	--	--	5.2
60	289.1	71.8	12.9	1.3	--	203.1
70	1,619.9	42.3	23.3	7.2	.7	1,546.4
All classes	1,920.0	114.1	42.0	8.5	.7	1,754.7

1/ See glossary for area-condition classes (page 2).

Table 7.--*Area of commercial forest land, by site and ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Site class (cubic feet of growth per acre per year)	All ownerships	National Forest	Other federal	State, county and municipal	Forest industry	Farmer and miscellaneous private
85-119	66.1	--	--	1.3	--	64.8
50-84	353.6	10.4	12.4	2.6	--	328.2
Less than 50	1,500.3	103.7	29.6	4.6	.7	1,361.7
All classes	1,920.0	114.1	42.0	8.5	.7	1,754.7

Table 8.--*Area of commercial forest land, by forest type and ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type	All ownerships	National Forest[1/]	Other federal	State, county and municipal	Forest industry	Farmer and miscellaneous private
Eastern redcedar	4.0	--	--	--	--	4.0
Eastern redcedar-hardwood	38.5	--	--	--	--	38.5
Post-blackjack oak	636.0	10.9	12.5	2.5	.4	609.7
Black-scarlet oak	630.5	79.6	5.5	5.1	--	540.3
White oak	338.9	17.4	--	--	.3	321.2
Elm-ash-cottonwood	64.1	4.4	12.4	.9	--	46.4
Maple-beech	11.1	--	--	--	--	11.1
Nonstocked[2/]	196.9	1.8	11.6	--	--	183.5
All forest types	1,920.0	114.1	42.0	8.5	.7	1,754.7

1/ Estimates of area of some forest types for National Forest owner differ from those shown in current timber management plans for the National Forests in Missouri.

2/ See glossary for stand-size classes (page 3).

Table 9.—*Area of commercial forest land, by forest type and stand-age class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type	All ages	Stand-age class (years)											
		0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-119	120+
Eastern redcedar	4.0	--	--	--	--	--	2.0	2.0	--	--	--	--	--
Eastern redcedar-hardwood	38.5	10.3	27.4	--	--	--	.4	.4	--	--	--	--	--
Post-blackjack oak	636.0	72.1	77.6	51.5	115.6	102.5	80.1	50.1	21.6	21.7	32.4	10.8	--
Black-scarlet oak	630.5	70.8	65.4	40.3	60.2	93.7	105.1	84.4	33.2	22.1	38.7	16.6	--
White oak	338.9	11.5	29.1	17.2	29.2	69.1	41.6	62.7	44.7	17.0	11.2	--	5.6
Elm-ash-cottonwood	64.1	3.8	3.8	3.8	--	17.6	11.6	17.8	--	5.7	--	--	--
Maple-beech	11.1	5.5	--	--	--	--	--	5.6	--	--	--	--	--
Nonstocked[1/]	196.9	82.1	32.7	5.6	5.4	--	16.6	21.8	11.1	10.7	10.9	--	--
All forest types	1,920.0	256.1	236.0	118.4	210.4	282.9	257.4	244.8	110.6	77.2	93.2	27.4	5.6

1/ See glossary for stand-size classes (page 3).

Table 10.--*Area of commercial forest land, by forest type and site-index class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type	All classes	Site-index class (height in feet at 50 years)							
		20-29	30-39	40-49	50-59	60-69	70-79	80-89	90+
Eastern redcedar	4.0	--	2.0	2.0	--	--	--	--	--
Eastern redcedar-hardwood	38.5	5.2	15.8	6.0	11.1	--	.4	--	--
Post-blackjack oak	636.0	10.8	85.3	213.4	205.8	74.0	34.4	12.3	--
Black-scarlet oak	630.5	--	5.7	122.0	231.4	193.3	66.7	11.4	--
White oak	338.9	--	17.2	75.2	172.7	73.8	--	--	--
Elm-ash-cottonwood	64.1	--	--	3.8	3.8	17.6	17.8	11.4	9.7
Maple-beech	11.1	--	--	--	11.1	--	--	--	--
Nonstocked[1/]	196.9	5.4	16.4	82.0	26.9	44.0	5.9	11.0	5.3
All forest types	1,920.0	21.4	142.4	504.4	662.8	402.7	125.2	46.1	15.0

1/ See glossary for stand-size classes (page 3).

Table 11.—*Area of commercial forest land, by forest type and basal-area class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type	All classes	Basal-area class (square feet per acre)						
		0-19	20-39	40-59	60-79	80-99	100-119	120-139
Eastern redcedar	4.0	--	--	--	2.0	2.0	--	--
Eastern redcedar-hardwood	38.5	11.1	5.6	10.3	11.1	.4	--	--
Post-blackjack oak	636.0	19.3	51.9	192.8	212.9	113.4	40.3	5.4
Black-scarlet oak	630.5	11.0	60.0	217.7	233.7	102.3	5.8	--
White oak	338.9	--	17.1	108.7	133.0	34.5	40.0	5.6
Elm-ash-cottonwood	64.1	--	5.7	17.3	5.7	23.5	11.9	--
Maple-beech	11.1	5.6	--	5.5	--	--	--	--
Nonstocked[1/]	196.9	10.9	76.2	82.4	27.4	--	--	--
All forest types	1,920.0	57.9	216.5	634.7	625.8	276.1	98.0	11.0

1/ See glossary for stand-size classes (page 3).

Table 12.--*Area of commercial forest land, by forest type, stand-size and site class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type and stand-size class	All site classes	85 to 120 cu. ft.	50 to 85 cu. ft.	Less than 50 cu. ft.
Eastern redcedar				
Sawtimber	--	--	--	--
Poletimber	4.0	--	--	4.0
Sapling and seedling	--	--	--	--
All stands	4.0	--	--	4.0
Eastern redcedar-hardwood				
Sawtimber	.8	--	.4	.4
Poletimber	--	--	--	--
Sapling and seedling	37.7	--	--	37.7
All stands	38.5	--	.4	38.1
Post-blackjack oak				
Sawtimber	134.9	--	10.8	124.1
Poletimber	344.6	5.9	51.7	287.0
Sapling and seedling	156.5	--	29.4	127.1
All stands	636.0	5.9	91.9	538.2
Black-scarlet oak				
Sawtimber	249.5	11.2	72.0	166.3
Poletimber	239.5	5.8	66.3	167.4
Sapling and seedling	141.5	--	49.1	92.4
All stands	630.5	17.0	187.4	426.1
White oak				
Sawtimber	134.7	--	5.5	129.2
Poletimber	163.7	--	11.8	151.9
Sapling and seedling	40.5	--	5.7	34.8
All stands	338.9	--	23.0	315.9
Elm-ash-cottonwood				
Sawtimber	52.7	23.3	17.8	11.6
Poletimber	--	--	--	--
Sapling and seedling	11.4	3.8	--	7.6
All stands	64.1	27.1	17.8	19.2
Maple-beech				
Sawtimber	--	--	--	--
Poletimber	--	--	--	--
Sapling and seedling	11.1	--	--	11.1
All stands	11.1	--	--	11.1
Nonstocked[1/]	196.9	16.2	33.1	147.6
Total all types	1,920.0	66.2	353.6	1,500.2

1/ See glossary for stand-size classes (page 3).

Table 13.--*Area of commercial forest land, by stocking class based on selected stand components, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Stocking percentage	Stocking classified in terms of					
	All trees	Growing-stock trees			Rough and rotten trees	Inhibiting vegetation
		Total	Desirable	Acceptable		
130+	33.8	--	--	--	--	--
120-129	94.7	--	--	--	5.4	--
110-119	170.3	--	--	--	--	--
100-109	405.4	11.0	--	5.6	22.8	--
90-99	457.4	9.7	--	9.7	17.4	--
80-89	446.1	73.0	--	40.0	84.2	--
70-79	157.7	81.1	--	75.0	211.6	--
60-69	105.1	107.9	--	124.4	374.4	--
50-59	38.7	309.5	--	297.9	383.5	--
40-49	5.4	268.1	5.4	274.0	406.1	--
30-39	5.4	406.6	5.9	418.0	213.6	
20-29	--	372.4	5.6	372.2	134.9	--
10-19	--	172.2	10.7	194.7	60.6	--
0-9	--	108.5	1,892.4	108.5	5.5	1,920.0
Total	1,920.0	1,920.0	1,920.0	1,920.0	1,920.0	1,920.0

Table 14.--*Area of commercial forest land, by stocking class of growing-stock trees and stand-size class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Stocking percentage	All stands	Sawtimber stands	Poletimber stands	Sapling and seedling stands	Nonstocked areas 1/
101 to 133	11.0	5.4	--	5.6	--
61 to 100	271.6	95.1	135.4	41.1	--
17 to 60	1,436.7	472.1	616.4	348.2	--
Less than 17	200.7	--	--	3.8	196.9
All classes	1,920.0	572.6	751.8	398.7	196.9

1/ See glossary for stand-size classes (page 3).

Table 15.--*Area of noncommercial forest land, by ownership class, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Ownership class	All areas	Productive-reserved areas	Unproductive areas
National Forest	1.9	--	1.9
Other public	83.8	73.6	10.2
Farmer and miscellaneous private	65.3	--	65.3
All ownerships	151.0	73.6	77.4

Table 16.--*Area of noncommercial forest land, by forest type, Northwestern Ozarks, Missouri, 1972*

(Thousand acres)

Forest type	All areas	Productive-reserved areas	Unproductive areas
Eastern redcedar	7.6	--	7.6
Eastern redcedar-hardwood	23.5	--	23.5
Post-blackjack oak	47.7	27.0	20.7
Black-scarlet oak	19.1	14.0	5.1
White oak	48.5	28.0	20.5
Elm-ash-cottonwood	4.6	4.6	--
All forest types	151.0	73.6	77.4

Table 17.—*Number of all live trees on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Thousand trees)

Species	All classes	Diameter class (inches at breast height)														
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
Softwoods:															
Shortleaf pine	350	--	--	119	46	--	93	52	14	26	--	--	--	--	--
Eastern redcedar	23,260	19,645	1,853	1,024	369	290	71	8	--	--	--	--	--	--	--
Total softwoods	23,610	19,645	1,853	1,143	415	290	164	60	14	26	--	--	--	--	--
Hardwoods:															
Select white oaks	144,118	74,859	25,105	13,500	12,377	7,824	4,497	3,359	1,288	670	273	141	185	40	--
Other white oaks	226,597	110,236	55,533	32,146	12,517	7,982	3,660	2,248	1,273	489	271	151	86	5	--
Select red oaks	13,211	5,597	1,732	1,469	1,418	1,210	604	562	382	99	49	34	55	--	--
Red oaks	165,060	85,835	30,337	18,989	10,932	7,150	5,057	3,037	1,759	934	463	268	251	48	--
Other red oaks	67,879	37,254	16,207	7,310	3,572	1,770	934	356	193	147	78	34	24	--	--
Hickory A	54,986	42,807	5,388	3,325	1,715	971	442	159	74	76	29	--	--	--	--
Hickory B	120,840	86,708	20,970	7,060	3,667	1,476	531	223	142	37	20	--	6	--	--
Hard maple	4,678	4,265	--	324	--	85	--	--	--	--	--	--	--	4	--
Soft maple	3,534	1,739	1,186	263	160	--	31	60	50	14	31	--	--	--	--
Tupelo and blackgum	1,360	1,144	--	--	49	119	--	--	32	12	--	--	--	4	--
Ash	19,292	12,922	4,333	750	500	451	231	67	18	11	--	9	--	--	--
Sycamore	3,157	1,142	--	581	403	310	255	209	130	64	--	24	25	9	5
River birch	42	--	--	--	--	--	--	--	16	11	9	--	6	--	--
Black walnut	9,363	3,850	1,964	1,303	1,305	440	311	101	60	13	--	9	7	--	--
Black cherry	2,353	1,671	169	299	182	--	--	--	--	12	20	--	--	--	--
Elm	41,144	29,589	8,163	2,357	669	153	80	63	13	36	21	--	--	--	--
Other hardwoods	120,070	103,851	11,313	2,608	1,266	576	137	211	62	37	--	--	6	3	--
Noncommercial species	30,857	28,328	2,192	337	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	1,028,541	631,797	184,592	92,621	50,732	30,517	16,770	10,655	5,492	2,662	1,264	670	651	113	5
All species	1,052,151	651,442	186,445	93,764	51,147	30,807	16,934	10,715	5,506	2,688	1,264	670	651	113	5

Table 18.--*Number of growing-stock trees on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Thousand trees)

Species	All classes	Diameter class (inches at breast height)												
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0+
Softwoods:														
Shortleaf pine	350	--	--	119	46	--	93	52	14	26	--	--	--	--
Eastern redcedar	20,462	17,471	1,854	674	271	153	39	--	--	--	--	--	--	--
Total softwoods	20,812	17,471	1,854	793	317	153	132	52	14	26	--	--	--	--
Hardwoods:														
Select white oaks	63,845	27,059	14,009	5,748	6,852	4,696	2,337	2,050	702	208	97	51	27	9
Other white oaks	74,256	29,668	16,157	16,029	6,178	3,364	1,406	988	282	133	19	24	8	--
Select red oaks	5,439	1,659	589	737	848	692	355	266	198	33	11	26	25	--
Red oaks	78,665	33,809	15,635	12,652	7,515	3,672	2,540	1,434	729	380	153	71	59	16
Other red oaks	12,368	6,100	3,215	1,705	745	315	122	83	32	13	18	8	12	--
Hickory A	20,605	16,009	724	1,977	879	582	206	95	60	64	9	--	--	--
Hickory B	38,144	22,278	8,860	3,994	1,803	733	278	124	46	12	10	--	6	--
Hard maple	2,312	2,212	--	100	--	--	--	--	--	--	--	--	--	--
Soft maple	2,207	593	1,186	263	113	--	31	--	--	--	21	--	--	--
Tupelo and blackgum	727	557	--	--	49	73	--	--	31	13	--	--	--	4
Ash	3,049	1,773	577	152	197	208	111	23	--	--	--	8	--	--
Sycamore	1,855	--	--	581	351	310	255	146	129	38	--	16	20	9
River birch	9	--	--	--	--	--	--	--	--	--	9	--	--	--
Black walnut	2,210	--	530	748	493	196	145	70	16	12	--	--	--	--
Black cherry	266	--	169	85	--	--	--	--	--	12	--	--	--	--
Elm	8,114	5,287	1,908	456	341	75	--	22	13	12	--	--	--	--
Other hardwoods	4,811	2,203	1,743	339	129	222	85	78	--	12	--	--	--	--
Total hardwoods	318,882	149,207	65,302	45,566	26,493	15,138	7,871	5,379	2,238	942	347	204	157	38
All species	339,694	166,678	67,156	46,359	26,810	15,291	8,003	5,431	2,252	968	347	204	157	38

Table 19.—*Number of short-log trees on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Thousand trees)

Species	All classes	Diameter class (inches at breast height)								
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	20.9-22.9	23.0-28.9	29.0+
Softwoods:										
Eastern redcedar	22	15	--	7	--	--	--	--	--	--
Total softwoods	22	15	--	7	--	--	--	--	--	--
Hardwoods:										
Select white oaks	1,580	--	823	401	156	108	40	17	26	9
Other white oaks	1,196	--	590	408	151	12	19	16	--	--
Select red oaks	80	--	48	--	32	--	--	--	--	--
Red oaks	1,343	--	579	370	275	69	30	16	--	4
Other red oaks	248	--	167	38	--	26	11	--	6	--
Hickory A	82	--	49	21	--	12	--	--	--	--
Hickory B	129	--	57	--	47	25	--	--	--	--
Ash	50	--	26	24	--	--	--	--	--	--
Sycamore	58	--	--	45	--	--	--	8	5	--
Black walnut	77	--	55	--	14	--	--	--	8	--
Black cherry	20	--	--	--	--	--	20	--	--	--
Elm	43	--	--	20	--	13	10	--	--	--
Other hardwoods	34	--	--	21	--	13	--	--	--	--
Total hardwoods	4,940	--	2,394	1,348	675	278	130	57	45	13
All species	4,962	15	2,394	1,355	675	278	130	57	45	13

Table 20.--*Net volume of growing stock and sawtimber on commercial forest land, by species, Northwestern Ozarks, Missouri, 1959 and 1972*

Species	Growing stock		Sawtimber	
	1959[1]	1972	1959[1]	1972
	Million cubic feet		Million board feet[2]	
Softwoods:				
Shortleaf pine	[3] --	4.2	[3] --	25.7
Eastern redcedar	2.1	3.8	.8	9.6
Other softwoods	1.4	--	8.4	--
Total softwoods	3.5	8.0	9.2	35.3
Hardwoods:				
Select white oaks	180.8	184.6	393.3	488.1
Other white oaks	129.4	132.2	236.0	211.8
Select red oaks	24.6	31.3	97.5	96.8
Red oaks	192.5	196.8	455.0	485.2
Other red oaks	9.0	13.9	22.2	30.6
Hickory A	12.0	22.1	24.0	39.9
Hickory B	19.5	29.2	14.0	34.0
Hard maple	[3] --	.3	--	--
Soft maple	[3] --	3.0	[3] --	8.4
Tupelo and blackgum	[3] --	2.9	[3] --	8.6
Ash	2.9	5.8	10.4	12.4
Sycamore	19.0	28.0	19.6	89.0
River birch	[3] --	.5	[3] --	3.2
Basswood	.9	--	--	--
Black walnut	14.2	9.3	31.2	18.3
Black cherry	1.4	.7	[3] --	2.0
Elm	11.2	4.3	4.9	5.9
Other hardwoods	5.3	5.9	4.2	14.6
Total hardwoods	622.7	670.8	1,312.3	1.548.8
All species	626.2	678.8	1,321.5	1,584.1

1/ Figures have been adjusted from those published previously for 1959 to conform to 1972 volumes because of changes in survey definitions and procedures.

2/ International 1/4-inch rule.

3/ Some species are shown as having no volume in 1959, but as having volume in 1972. This situation results from the sparseness of trees of those species and the resulting low chance of their being sampled. In 1959 no trees of those species were encountered, but in 1972 some were sampled. Sampling errors, which provide a measure of the reliability of estimates, increase as the size of the population being sampled decreases. (See Accuracy of Survey in Appendix)

Table 21.--*Net volume on commercial forest land for Missouri's Northwestern Ozarks Survey Unit and for individual counties within Unit, by species and kind of material, 1972*

ALL COUNTIES

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1/]			Thousand cords
Softwoods:							
Shortleaf pine	52.3	6.4	45.9	25.7	5.6	20.1	--
Eastern redcedar	48.0	28.4	19.6	9.6	.2	9.4	20.9
Total softwoods	100.3	34.8	65.5	35.3	5.8	29.5	20.9
Hardwoods:							
Select white oaks	2,337.0	1,063.4	1,273.6	488.1	336.9	151.2	1,579.9
Other white oaks	1,673.0	1,124.9	548.1	211.8	134.6	77.2	1,724.2
Select red oaks	395.7	146.4	249.3	96.8	55.3	41.5	202.4
Red oaks	2,492.8	1,244.4	1,248.4	485.2	310.4.	174.8	1,678.5
Other red oaks	176.9	105.2	71.7	30.6	22.4	8.2	493.9
Hickory A	278.4	168.4	110.0	39.9	27.7	12.2	151.4
Hickory B	368.9	273.7	95.2	34.0	14.8	19.2	259.3
Hard maple	3.2	3.2	--	--	--	--	12.4
Soft maple	38.7	19.1	19.6	8.4	8.4	--	41.2
Tupelo and blackgum	37.5	13.6	23.9	8.6	5.5	3.1	1.4
Ash	73.4	38.6	34.8	12.4	10.8	1.6	76.6
Sycamore	354.4	97.9	256.5	89.0	86.5	2.5	42.2
River birch	5.7	--	5.7	3.2	3.2	--	8.0
Black walnut	117.4	73.8	43.6	18.3	3.5	14.8	106.8
Black cherry	8.1	3.2	4.9	2.0	2.0	--	24.9
Elm	54.1	37.7	16.4	5.9	5.9	--	89.7
Other hardwoods	75.3	41.4	33.9	14.6	11.9	2.7	135.4
Noncommercial species	--	--	--	--	--	--	5.3
Total hardwoods	8,490.5	4,454.9	4,035.6	1,548.8	1,039.8	509.0	6,633.5
All species	8,590.8	4,489.7	4,101.1	1,584.1	1,045.6	538.5	6,654.4

BENTON COUNTY

Softwoods:							
Shortleaf pine	4.1	.5	3.6	2.0	.5	1.5	--
Eastern redcedar	3.5	2.1	1.4	.7	--	.7	1.5
Total softwoods	7.6	2.6	5.0	2.7	.5	2.2	1.5
Hardwoods:							
Select white oaks	204.9	91.1	113.8	43.7	30.8	12.9	141.3
Other white oaks	143.0	93.0	50.0	19.2	13.0	6.2	145.1
Select red oaks	35.2	13.0	22.2	8.7	5.1	3.6	18.1
Red oaks	213.1	102.2	110.9	43.1	28.9	14.2	146.5
Other red oaks	15.6	8.5	7.1	3.0	2.3	.7	43.9
Hickory A	24.7	14.5	10.2	3.7	2.7	1.0	13.2
Hickory B	31.3	22.9	8.4	3.0	1.4	1.6	22.7
Hard maple	.3	.3	--	--	--	--	1.2
Soft maple	4.7	2.3	2.4	1.0	1.0	--	4.9
Tupelo and blackgum	.3.3	1.2	2.1	.8	.5	.3	.1
Ash	7.3	3.5	3.8	1.3	1.2	.1	7.9
Sycamore	39.9	10.9	29.0	10.0	9.8	.2	4.7
River birch	.6	--	.6	.3	.3	--	.7
Black walnut	10.1	6.5	3.6	1.6	.3	1.3	9.6
Black cherry	.8	.3	.5	.2	.2	--	2.2
Elm	5.3	3.6	1.7	.6	.6	--	8.0
Other hardwoods	7.9	4.4	3.5	1.5	1.2	.3	13.8
Noncommercial species	--	--	--	--	--	--	.5
Total hardwoods	748.0	378.2	369.8	141.7	99.3	42.4	584.4
All species	755.6	380.8	374.8	144.4	99.8	44.6	585.9

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

CAMDEN COUNTY

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1/]			Thousand cords
Softwoods:							
Shortleaf pine	5.2	.6	4.6	2.6	.6	2.0	--
Eastern redcedar	6.1	3.6	2.5	1.2	--	1.2	2.6
Total softwoods	11.3	4.2	7.1	3.8	.6	3.2	2.6
Hardwoods:							
Select white oaks	259.3	117.0	142.3	54.7	38.0	16.7	177.5
Other white oaks	184.2	122.9	61.3	23.7	15.2	8.5	191.0
Select red oaks	43.9	16.5	27.4	10.6	6.2	4.4	22.9
Red oaks	275.7	135.1	140.6	54.6	35.6	19.0	191.0
Other red oaks	18.4	11.4	7.0	3.0	2.1	.9	52.9
Hickory A	29.9	18.6	11.3	4.1	2.8	1.3	16.3
Hickory B	41.2	30.5	10.7	3.8	1.7	2.1	29.0
Hard maple	.4	.4	--	--	--	--	1.4
Soft maple	2.9	1.4	1.5	.7	.7	--	3.2
Tupelo and blackgum	4.3	1.6	2.7	1.0	.7	.3	.2
Ash	7.0	3.9	3.1	1.1	.9	.2	7.2
Sycamore	29.8	8.1	21.7	7.5	7.2	.3	3.5
River birch	.5	--	.5	.3	.3	--	.8
Black walnut	12.9	7.9	5.0	2.1	.4	1.7	11.8
Black cherry	.8	.4	.4	.2	.2	--	2.7
Elm	5.3	3.8	1.5	.5	.5	--	9.6
Other hardwoods	7.3	4.0	3.3	1.4	1.2	.2	13.0
Noncommercial species	--	--	--	--	--	--	.6
Total hardwoods	923.8	483.5	440.3	169.3	113.7	55.6	734.6
All species	935.1	487.7	447.4	173.1	114.3	58.8	737.2

CEDAR COUNTY

Softwoods:							
Shortleaf pine	1.6	.2	1.4	.8	.2	.6	--
Eastern redcedar	1.2	.7	.5	.2	--	.2	.6
Total softwoods	2.8	.9	1.9	1.0	.2	.8	.6
Hardwoods:							
Select white oaks	86.1	38.0	48.1	18.5	13.1	5.4	61.0
Other white oaks	60.9	39.1	21.8	8.4	5.7	2.7	62.2
Select red oaks	15.0	5.5	9.5	3.7	2.2	1.5	7.9
Red oaks	90.4	42.8	47.6	18.5	12.5	6.0	63.2
Other red oaks	6.9	3.5	3.4	1.4	1.1	.3	19.3
Hickory A	11.0	6.3	4.7	1.7	1.3	.4	5.7
Hickory B	13.3	9.7	3.6	1.3	.6	.7	9.8
Hard maple	.1	.1	--	--	--	--	.5
Soft maple	2.3	1.1	1.2	.5	.5	--	2.4
Tupelo and blackgum	1.4	.5	.9	.3	.2	.1	--
Ash	3.4	1.6	1.8	.7	.6	.1	3.8
Sycamore	19.3	5.2	14.1	4.9	4.8	.1	2.3
River birch	.3	--	.3	.2	.2	--	.4
Black walnut	4.5	3.0	1.5	.6	.1	.5	4.3
Black cherry	.4	.1	.3	.1	.1	--	1.0
Elm	2.5	1.6	.9	.3	.3	--	3.7
Other hardwoods	3.5	1.9	1.6	.7	.6	.1	6.1
Noncommercial species	--	--	--	--	--	--	.2
Total hardwoods	321.3	160.0	161.3	61.8	43.9	17.9	253.8
All species	324.1	160.9	163.2	62.8	44.1	18.7	254.4

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

DALLAS COUNTY

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1/]			Thousand cords
Softwoods:							
Shortleaf pine	3.2	.4	2.8	1.6	.4	1.2	--
Eastern redcedar	2.6	1.6	1.0	.5	.1	.4	1.4
Total softwoods	5.8	2.0	3.8	2.1	.5	1.6	1.4
Hardwoods:							
Select white oaks	153.9	69.0	84.9	32.6	22.8	9.8	106.4
Other white oaks	109.1	71.5	37.6	14.4	9.6	4.8	110.6
Select red oaks	26.3	9.7	16.6	6.4	3.7	2.7	13.6
Red oaks	162.6	79.1	83.5	32.4	21.4	11.0	111.0
Other red oaks	11.9	6.6	5.3	2.2	1.7	.5	32.9
Hickory A	19.0	11.1	7.9	2.9	2.1	.8	10.0
Hickory B	24.0	17.6	6.4	2.3	1.1	1.2	17.2
Hard maple	.2	.2	--	--	--	--	.9
Soft maple	3.2	1.6	1.6	.7	.7	--	3.4
Tupelo and blackgum	2.5	.9	1.6	.6	.4	.2	.1
Ash	5.4	2.7	2.7	1.0	.9	.1	5.7
Sycamore	28.9	8.1	20.8	7.2	7.0	.2	3.6
River birch	.5	--	.5	.3	.3	--	.6
Black walnut	7.8	5.0	2.8	1.2	.3	.9	7.3
Black cherry	.6	.2	.4	.2	.2	--	1.7
Elm	4.0	2.7	1.3	.5	.5	--	6.2
Other hardwoods	5.6	2.9	2.7	1.1	1.0	.1	9.7
Noncommercial species	--	--	--	--	--	--	.4
Total hardwoods	565.5	288.9	276.6	106.0	73.7	32.3	441.3
All species	571.3	290.9	280.4	108.1	74.2	33.9	442.7

HICKORY COUNTY

Softwoods:							
Shortleaf pine	2.5	.3	2.2	1.3	.3	1.0	--
Eastern redcedar	1.8	1.1	.7	.3	--	.3	1.2
Total softwoods	4.3	1.4	2.9	1.6	.3	1.3	1.2
Hardwoods:							
Select white oaks	124.4	55.5	68.9	26.4	18.6	7.8	84.0
Other white oaks	87.2	56.5	30.7	11.8	8.0	3.8	87.1
Select red oaks	21.0	7.8	13.2	5.1	3.0	2.1	10.5
Red oaks	129.8	62.4	67.4	26.2	17.6	8.6	87.9
Other red oaks	9.7	5.2	4.5	1.9	1.5	.4	26.0
Hickory A	15.8	9.0	6.8	2.4	1.8	.6	8.1
Hickory B	19.2	14.1	5.1	1.8	.9	.9	13.6
Hard maple	.2	.2	--	--	--	--	.7
Soft maple	2.3	1.1	1.2	.5	.5	--	2.5
Tupelo and blackgum	2.1	.8	1.3	.5	.3	.2	.1
Ash	4.3	2.1	2.2	.8	.7	.1	5.0
Sycamore	21.6	5.5	16.1	5.7	5.6	.1	2.7
River birch	.6	--	.6	.3	.3	--	.6
Black walnut	6.4	4.4	2.0	.9	.2	.7	5.7
Black cherry	.7	.2	.5	.2	.2	--	1.5
Elm	3.2	2.1	1.1	.4	.4	--	5.4
Other hardwoods	3.7	2.0	1.7	.8	.7	.1	7.2
Noncommercial species	--	--	--	--	--	--	.3
Total hardwoods	452.2	228.9	223.3	85.7	60.3	25.4	348.9
All species	456.5	230.3	226.2	87.3	60.6	26.7	350.1

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

LACLEDE COUNTY

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1/]			Thousand cords
Softwoods:							
Shortleaf pine	5.1	.6	4.5	2.5	.5	2.0	--
Eastern redcedar	5.2	3.1	2.1	1.0	.1	.9	2.4
Total softwoods	10.3	3.7	6.6	3.5	.6	2.9	2.4
Hardwoods:							
Select white oaks	230.4	105.0	125.4	48.1	33.1	15.0	157.6
Other white oaks	169.0	116.4	52.6	20.4	12.4	8.0	179.2
Select red oaks	38.9	14.5	24.4	9.5	5.4	4.1	20.2
Red oaks	247.5	124.8	122.7	47.7	30.2	17.5	168.1
Other red oaks	17.1	10.7	6.4	2.8	1.9	.9	48.8
Hickory A	26.7	16.6	10.1	3.7	2.5	1.2	15.2
Hickory B	36.9	27.6	9.3	3.3	1.4	1.9	25.8
Hard maple	.3	.3	--	--	--	--	1.2
Soft maple	2.8	1.4	1.4	.6	.6	--	3.1
Tupelo and blackgum	3.8	1.4	2.4	.9	.6	.3	.1
Ash	6.4	3.6	2.8	1.0	.8	.2	6.5
Sycamore	28.0	8.1	19.9	6.9	6.7	.2	3.4
River birch	.4	--	.4	.2	.2	--	.7
Black walnut	11.7	6.9	4.8	2.0	.4	1.6	10.8
Black cherry	.7	.3	.4	.1	.1	--	2.4
Elm	4.8	3.5	1.3	.5	.5	--	8.4
Other hardwoods	7.3	3.9	3.4	1.4	1.1	.3	13.0
Noncommercial species	--	--	--	--	--	--	.5
Total hardwoods	832.7	445.0	387.7	149.1	97.9	51.2	665.0
All species	843.0	448.7	394.3	152.6	98.5	54.1	667.4

MARIES COUNTY

Softwoods:							
Shortleaf pine	4.1	.5	3.6	2.0	.4	1.6	--
Eastern redcedar	2.7	1.7	1.0	.5	--	.5	.9
Total softwoods	6.8	2.2	4.6	2.5	.4	2.1	.9
Hardwoods:							
Select white oaks	166.5	77.4	89.1	34.0	22.7	11.3	109.2
Other white oaks	123.6	86.6	37.0	14.4	8.3	6.1	128.3
Select red oaks	27.3	10.1	17.2	6.7	3.4	3.3	14.0
Red oaks	179.8	97.2	82.6	32.1	18.5	13.6	117.6
Other red oaks	12.2	8.4	3.8	1.7	1.1	.6	34.4
Hickory A	18.5	12.0	6.5	2.4	1.4	1.0	10.6
Hickory B	27.7	21.0	6.7	2.4	.9	1.5	18.8
Hard maple	.2	.2	--	--	--	--	.7
Soft maple	1.6	.8	.8	.3	.3	--	1.7
Tupelo and blackgum	2.7	1.0	1.7	.6	.4	.2	.1
Ash	4.4	2.7	1.7	.6	.5	.1	4.0
Sycamore	16.1	4.8	11.3	3.9	3.7	.2	1.8
River birch	.1	--	.1	.1	.1	--	.4
Black walnut	8.1	5.0	3.1	1.2	.2	1.0	7.1
Black cherry	.3	.2	.1	.1	.1	--	1.6
Elm	3.1	2.4	.7	.2	.2	--	5.4
Other hardwoods	4.9	2.8	2.1	.9	.6	.3	8.7
Noncommercial species	--	--	--	--	--	--	.3
Total hardwoods	597.1	332.6	264.5	101.6	62.4	39.2	464.7
All species	603.9	334.8	269.1	104.1	62.8	41.3	465.6

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

MILLER COUNTY

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1/]			Thousand cords
Softwoods:							
Shortleaf pine	4.3	.5	3.8	2.1	.5	1.6	--
Eastern redcedar	2.9	1.9	1.0	.5	--	.5	1.0
Total softwoods	7.2	2.4	4.8	2.6	.5	2.1	1.0
Hardwoods:							
Select white oaks	188.6	86.0	102.6	39.3	27.0	12.3	127.6
Other white oaks	134.1	90.8	43.3	16.7	10.5	6.2	138.0
Select red oaks	31.5	11.6	19.9	7.7	4.3	3.4	16.3
Red oaks	197.1	99.8	97.3	37.8	23.8	14.0	132.6
Other red oaks	14.3	8.5	5.8	2.5	1.8	.7	40.3
Hickory A	22.0	13.4	8.6	3.1	2.1	1.0	12.1
Hickory B	29.3	21.8	7.5	2.7	1.1	1.6	20.9
Hard maple	.2	.2	--	--	--	--	.9
Soft maple	3.8	1.9	1.9	.8	.8	--	3.9
Tupelo and blackgum	3.0	1.1	1.9	.7	.4	.3	.1
Ash	6.3	3.2	3.1	1.1	1.0	.1	6.4
Sycamore	32.4	9.2	23.2	8.0	7.8	.2	3.8
River birch	.4	--	.4	.2	.2	--	.6
Black walnut	9.1	5.8	3.3	1.4	.3	1.1	8.6
Black cherry	.5	.2	.3	.1	.1	--	1.9
Elm	4.5	3.2	1.3	.5	.5	--	7.0
Other hardwoods	6.4	3.6	2.8	1.2	1.0	.2	11.3
Noncommercial species	--	--	--	--	--	--	.4
Total hardwoods	683.5	360.3	323.2	123.8	82.7	41.1	532.7
All species	690.7	362.7	328.0	126.4	83.2	43.2	533.7

MORGAN COUNTY

Softwoods:							
Shortleaf pine	4.7	.6	4.1	2.3	.5	1.8	--
Eastern redcedar	4.3	2.3	2.0	1.0	--	1.0	1.6
Total softwoods	9.0	2.9	6.1	3.3	.5	2.8	1.6
Hardwoods:							
Select white oaks	212.0	96.9	115.1	44.0	30.4	13.6	134.3
Other white oaks	148.2	97.0	51.2	19.7	13.2	6.5	147.2
Select red oaks	35.4	13.2	22.2	8.6	5.1	3.5	16.9
Red oaks	223.9	109.8	114.1	44.4	29.2	15.2	146.5
Other red oaks	14.6	9.1	5.5	2.4	1.7	.7	41.7
Hickory A	23.7	14.7	9.0	3.3	2.2	1.1	12.8
Hickory B	32.7	24.1	8.6	3.1	1.5	1.6	22.4
Hard maple	.3	.3	--	--	--	--	.9
Soft maple	2.4	1.2	1.2	.5	.5	--	2.6
Tupelo and blackgum	3.4	1.2	2.2	.8	.5	.3	.1
Ash	5.4	3.1	2.3	.8	.7	.1	5.3
Sycamore	23.8	6.7	17.1	5.9	5.7	.2	2.7
River birch	.3	--	.3	.2	.2	--	.6
Black walnut	9.7	6.1	3.6	1.5	.3	1.2	8.1
Black cherry	.6	.3	.3	.1	.1	--	2.0
Elm	4.3	3.1	1.2	.4	.4	--	7.2
Other hardwoods	5.3	3.0	2.3	1.0	.9	.1	9.8
Noncommercial species	--	--	--	--	--	--	.5
Total hardwoods	746.0	389.8	356.2	136.7	92.6	44.1	561.6
All species	755.0	392.7	362.3	140.0	93.1	46.9	563.2

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1]			Thousand cords
PHELPS COUNTY							
Softwoods:							
Shortleaf pine	7.9	1.0	6.9	3.8	.6	3.2	--
Eastern redcedar	7.2	4.0	3.2	1.6	--	1.6	2.2
Total softwoods	15.1	5.0	10.1	5.4	.6	4.8	2.2
Hardwoods:							
Select white oaks	263.2	124.0	139.2	53.2	35.7	17.5	169.1
Other white oaks	190.8	134.1	56.7	22.1	12.7	9.4	198.9
Select red oaks	44.1	16.2	27.9	10.9	6.1	4.8	21.5
Red oaks	295.1	153.2	141.9	55.2	32.9	22.3	186.7
Other red oaks	19.0	13.3	5.7	2.5	1.6	.9	52.1
Hickory A	29.2	18.9	10.3	3.7	2.3	1.4	16.8
Hickory B	42.6	31.9	10.7	3.8	1.4	2.4	28.2
Hard maple	.4	.4	--	--	--	--	1.0
Soft maple	2.0	1.0	1.0	.4	.4	--	2.2
Tupelo and blackgum	4.1	1.4	2.7	.9	.6	.3	.2
Ash	6.1	3.9	2.2	.8	.6	.2	5.6
Sycamore	21.8	6.4	15.4	5.3	5.0	.3	2.3
River birch	.2	--	.2	.1	.1	--	.7
Black walnut	12.6	7.5	5.1	2.1	.4	1.7	10.8
Black cherry	.5	.4	.1	.1	.1	--	2.4
Elm	4.7	3.6	1.1	.4	.4	--	8.5
Other hardwoods	6.2	3.4	2.8	1.2	.9	.3	11.2
Noncommercial species	--	--	--	--	--	--	.5
Total hardwoods	942.6	519.6	423.0	162.7	101.2	61.5	718.7
All species	957.7	524.6	433.1	168.1	101.8	66.3	720.9
POLK COUNTY							
Softwoods:							
Shortleaf pine	2.0	.3	1.7	1.0	.2	.8	--
Eastern redcedar	5.0	2.7	2.3	1.1	--	1.1	1.9
Total softwoods	7.0	3.0	4.0	2.1	.2	1.9	1.9
Hardwoods:							
Select white oaks	94.6	43.4	51.2	19.6	13.5	6.1	67.0
Other white oaks	67.8	45.9	21.9	8.5	5.3	3.2	72.6
Select red oaks	16.4	6.1	10.3	4.0	2.3	1.7	9.1
Red oaks	100.5	49.9	50.6	19.7	12.6	7.1	70.4
Other red oaks	8.2	4.2	4.0	1.6	1.3	.3	23.3
Hickory A	12.5	7.1	5.4	1.9	1.4	.5	6.6
Hickory B	14.7	10.9	3.8	1.4	.6	.8	11.0
Hard maple	.1	.1	--	--	--	--	.7
Soft maple	2.9	1.5	1.4	.7	.7	--	3.0
Tupelo and blackgum	1.4	.5	.9	.3	.2	.1	.1
Ash	4.2	1.9	2.3	.8	.7	.1	4.5
Sycamore	24.2	6.6	17.6	6.1	6.0	.1	2.9
River birch	.4	--	.4	.2	.2	--	.4
Black walnut	5.6	3.3	2.3	1.0	.1	.9	5.0
Black cherry	.5	.1	.4	.1	.1	--	1.2
Elm	2.9	1.9	1.0	.4	.4	--	4.7
Other hardwoods	4.3	2.4	1.9	.8	.6	.2	7.7
Noncommercial species	--	--	--	--	--	--	.2
Total hardwoods	361.2	185.8	175.4	67.1	46.0	21.1	290.4
All species	368.2	188.8	179.4	69.2	46.2	23.0	292.3

1/ International 1/4-inch rule.

(Table 21 cont. on next page)

(Table 21 cont.)

Species	Growing stock			Sawtimber			Rough and rotten trees
	Total	Poletimber trees	Sawtimber trees	Total	In sawtimber stands	Other stands	
	Thousand cords			Million board feet[1]			Thousand cords
PULASKI COUNTY							
Softwoods:							
Shortleaf pine	4.7	.6	4.1	2.3	.5	1.8	--
Eastern redcedar	3.4	2.2	1.2	.6	--	.6	1.8
Total softwoods	8.1	2.8	5.3	2.9	.5	2.4	1.8
Hardwoods:							
Select white oaks	208.1	96.1	112.0	42.9	29.1	13.8	141.0
Other white oaks	153.6	105.8	47.8	18.6	11.2	7.4	160.9
Select red oaks	35.4	13.0	22.4	8.7	4.8	3.9	18.1
Red oaks	226.9	116.7	110.2	42.8	26.4	16.4	152.0
Other red oaks	16.2	9.9	6.3	2.7	1.9	.8	44.5
Hickory A	25.3	15.4	9.9	3.6	2.4	1.2	14.0
Hickory B	34.0	25.5	8.5	3.0	1.2	1.8	23.5
Hard maple	.3	.3	--	--	--	--	1.1
Soft maple	3.1	1.5	1.6	.7	.7	--	3.3
Tupelo and blackgum	3.2	1.1	2.1	.7	.4	.3	.1
Ash	6.4	3.5	2.9	1.0	.9	.1	6.6
Sycamore	28.9	8.0	20.9	7.3	7.1	.2	3.5
River birch	.5	--	.5	.3	.3	--	.7
Black walnut	10.7	6.8	3.9	1.6	.3	1.3	9.9
Black cherry	.7	.3	.4	.2	.2	--	2.3
Elm	4.7	3.3	1.4	.5	.5	--	8.2
Other hardwoods	6.0	3.3	2.7	1.2	1.0	.2	11.2
Noncommercial species	--	--	--	--	--	--	.5
Total hardwoods	764.0	410.5	353.5	135.8	88.4	47.4	601.4
All species	772.1	413.3	358.8	138.7	88.9	49.8	603.2
ST. CLAIR COUNTY							
Softwoods:							
Shortleaf pine	2.9	.3	2.6	1.4	.4	1.0	--
Eastern redcedar	2.1	1.4	.7	.4	--	.4	1.8
Total softwoods	5.0	1.7	3.3	1.8	.4	1.4	1.8
Hardwoods:							
Select white oaks	145.0	64.0	81.0	31.1	22.1	9.0	103.9
Other white oaks	101.5	65.3	36.2	13.9	9.5	4.4	103.1
Select red oaks	25.3	9.2	16.1	6.2	3.7	2.5	13.3
Red oaks	150.4	71.4	79.0	30.7	20.8	9.9	105.0
Other red oaks	12.8	5.9	6.9	2.9	2.4	.5	33.8
Hickory A	20.1	10.8	9.3	3.4	2.7	.7	10.0
Hickory B	22.0	16.1	5.9	2.1	1.0	1.1	16.4
Hard maple	.2	.2	--	--	--	--	1.2
Soft maple	4.7	2.3	2.4	1.0	1.0	--	5.0
Tupelo and blackgum	2.3	.9	1.4	.5	.3	.2	.1
Ash	6.8	2.9	3.9	1.4	1.3	.1	8.1
Sycamore	39.7	10.3	29.4	10.3	10.1	.2	5.0
River birch	.9	--	.9	.5	.5	--	.8
Black walnut	8.2	5.6	2.6	1.1	.2	.9	7.8
Black cherry	1.0	.2	.8	.3	.3	--	2.0
Elm	4.8	2.9	1.9	.7	.7	--	7.4
Other hardwoods	6.9	3.8	3.1	1.4	1.1	.3	12.7
Noncommercial species	--	--	--	--	--	--	.4
Total hardwoods	552.6	271.8	280.8	107.5	77.7	29.8	436.0
All species	557.6	273.5	284.1	109.3	78.1	31.2	437.8

1/ International 1/4-inch rule.

Table 22.--*Net volume of timber on commercial forest land, by class of timber and softwoods and hardwoods, Northwestern Ozarks, Missouri, 1972*

(Million cubic feet)

Class of timber	All species	Softwoods	Hardwoods
Growing-stock trees:			
Saw log trees:			
Saw log portion	226.1	4.2	221.9
Upper stem portion	98.0	1.0	97.0
Total sawtimber	324.1	5.2	318.9
Poletimber trees	354.7	2.8	351.9
Total growing stock	678.8	8.0	670.8
Cull trees:			
Rough cull trees:			
Sawtimber	139.3	.9	138.4
Poletimber	232.8	.6	232.2
Total rough cull	372.1	1.5	370.6
Short log cull trees:			
Sawtimber	78.3	.1	78.2
Poletimber	--	--	--
Total short log	78.3	.1	78.2
Rotten cull trees:			
Sawtimber	51.6	--	51.6
Poletimber	23.7	--	23.7
Total rotten cull	75.3	--	75.3
Total cull	525.7	1.6	524.1
Salvable dead trees:			
Sawtimber	6.1	--	6.1
Poletimber	3.8	.2	3.6
Total salvable dead	9.9	.2	9.7
All classes	1,214.4	9.8	1,204.6

Table 23.--*Net volume of growing stock, sawtimber, and rough and rotten trees on commercial forest land, by individual species, Northwestern Ozarks, Missouri, 1972*

Species	Growing stock	Sawtimber	Rough and rotten trees
	Million cubic feet	Million board feet[1]/	Million cubic feet
Softwoods:			
Shortleaf pine	4.2	25.7	--
Eastern redcedar	3.8	9.6	1.6
Total softwoods	8.0	35.3	1.6
Hardwoods:			
Select white oak group			
Bur oak	--	--	1.1
Chinkapin oak	5.9	11.3	18.7
White oak	178.1	475.2	104.2
Swamp chestnut oak	.3	1.6	--
Swamp white oak	.3	--	.8
Other white oak group			
Post oak	132.2	211.8	136.2
Select red oak group			
Northern red oak	30.0	91.7	14.8
Shumard oak	1.3	5.1	1.2
Red oak group			
Black oak	192.4	471.1	126.0
Scarlet oak	4.4	14.1	6.4
Southern red oak	--	--	.2
Other red oak group			
Blackjack oak	10.4	16.9	29.9
Pin oak	2.5	12.1	3.4
Shingle oak	.8	1.6	5.7
Willow oak	.2	--	--
Hickory A group			
Mockernut hickory	13.8	25.6	7.5
Pecan	.2	--	--
Shagbark hickory	6.9	11.3	3.6
Shellbark hickory	1.2	3.0	.9
Hickory B group			
Black hickory	2.6	2.6	.7
Bitternut hickory	2.6	3.5	1.7
Pignut hickory	24.0	27.9	18.1
Hardwoods (cont.):			
Hard maple group			
Sugar maple	.3	--	1.0
Soft maple group			
Red maple	--	--	.2
Silver maple	3.0	8.4	3.1
Sweetgum	--	--	--
Tupelo and blackgum group			
Blackgum	2.9	8.6	.1
Ash group			
Blue ash	.3	--	--
Green ash	2.5	6.6	2.4
White ash	3.0	5.8	3.6
Sycamore group			
American sycamore	28.0	89.0	3.4
River birch	.5	3.2	.6
Black walnut	9.3	18.3	8.4
Black cherry	.7	2.0	2.0
Elm group			
American elm	3.5	3.9	5.8
Slippery elm	.8	2.0	1.3
Other hardwoods			
Black locust	--	--	.4
Black willow	.8	.2	.1
Boxelder	.3	1.6	1.8
Butternut	--	--	.2
Common persimmon	--	--	.9
Flowering dogwood	--	--	.5
Hackberry	3.2	5.9	3.1
Honeylocust	.3	--	1.3
Kentucky coffeetree	.1	1.7	.2
Osage orange	--	--	.2
Red mulberry	.3	3.0	1.3
Sassfras	.5	1.1	.7
Sugarberry	.4	1.1	--
Noncommercial	--	--	.4
Total hardwoods	670.8	1,548.8	524.1
All species	678.8	1,584.1	525.7

1/ International 1/4-inch rule.

Table 24.--*Net volume of growing stock and sawtimber on commercial forest land, by ownership class and species group, Northwestern Ozarks, Missouri, 1972*

GROWING STOCK

Ownership class	All species	Shortleaf pine	Other softwoods	Soft hardwoods	Hard hardwoods
			Thousand cords		
National Forest	678.7	17.7	0.6	27.9	632.5
Other federal	230.8	--	--	208.2	22.6
State, county and municipal	34.8	--	--	--	34.8
Forest industry	1.8	--	--	--	1.8
Farmer and miscellaneous private	7,644.7	34.6	47.4	317.2	7,245.5
All ownerships	8,590.8	52.3	48.0	553.3	7,937.2
SAWTIMBER					
			Million board feet[1/]		
National Forest	140.4	6.8	--	4.7	128.9
Other federal	44.2	--	--	40.8	3.4
State, county and municipal	2.8	--	--	--	2.8
Forest industry	--	--	--	--	--
Farmer and miscellaneous private	1,396.7	18.9	9.6	78.9	1,289.3
All ownerships	1,584.1	25.7	9.6	124.4	1,424.4

1/ International 1/4-inch rule.

Table 25.--*Net volume of growing stock on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Thousand cords)

Species	All classes	Diameter class (inches at breast height)											
		5.0-6.9	7.0-9.9	9-0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
Softwoods:													
Shortleaf pine	52.3	2.1	4.3	--	18.7	13.9	3.4	9.9	--	--	--	--	--
Eastern redcedar	48.0	13.9	14.5	13.5	6.1	--	--	--	--	--	--	--	--
Total softwoods	100.3	16.0	18.8	13.5	24.8	13.9	3.4	9.9	--	--	--	--	--
Hardwoods:													
Select white oaks	2,337.0	156.3	406.7	500.5	385.7	478.7	227.0	82.2	49.6	27.8	15.7	6.8	--
Other white oaks	1,673.0	461.3	360.2	303.4	200.1	201.3	78.4	44.6	6.0	12.9	4.8	--	--
Select red oaks	395.7	24.4	51.3	70.6	61.1	59.1	63.3	14.5	4.8	20.1	26.5	--	--
Red oaks	2,492.8	383.4	471.7	389.3	394.1	312.2	218.1	142.8	74.1	40.7	44.6	21.8	--
Other red oaks	176.9	40.5	37.7	27.0	16.6	13.1	6.2	7.1	8.5	6.5	13.7	--	--
Hickory A	278.4	62.6	51.8	54.0	31.3	24.4	19.6	27.1	7.6	--	--	--	--
Hickory B	368.9	107.5	97.4	68.8	46.9	20.1	14.0	6.4	4.5	--	3.3	--	--
Hard maple	3.2	3.2	--	--	--	--	--	--	--	--	--	--	--
Soft maple	38.7	7.2	12.1	--	2.9	--	--	--	16.5	--	--	--	--
Tupelo and blackgum	37.5	--	4.2	9.3	--	--	12.0	5.1	--	--	--	6.9	--
Ash	73.4	3.4	10.3	24.8	19.6	7.3	--	--	--	8.0	--	--	--
Sycamore	354.4	24.1	27.7	46.2	63.9	52.2	53.6	22.8	--	17.8	25.6	20.5	--
River birch	5.7	--	--	--	--	--	--	--	5.7	--	--	--	--
Black walnut	117.4	23.4	30.1	20.3	21.6	12.9	3.5	5.6	--	--	--	--	--
Black cherry	8.1	3.2	--	--	--	--	--	4.9	--	--	--	--	--
Elm	54.1	11.6	19.3	6.7	--	5.0	5.8	5.7	--	--	--	--	--
Other hardwoods	75.3	12.0	7.2	22.2	12.2	13.4	--	8.3	--	--	--	--	--
Total hardwoods	8,490.5	1,324.1	1,587.7	1,543.1	1,256.0	1,199.7	701.5	377.1	177.3	133.8	134.2	56.0	--
All species	8,590.8	1,340.1	1,606.5	1,556.6	1,280.8	1,213.6	704.9	387.0	177.3	133.8	134.2	56.0	--

Table 26.--*Net volume of sawtimber on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Million board feet)[1/]

Species	All classes	Diameter class (inches at breast height)									
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
Softwoods:											
Shortleaf pine	25.7	--	9.4	7.9	2.9	5.5	--	--	--	--	--
Eastern redcedar	9.6	6.8	2.8	--	--	--	--	--	--	--	--
Total softwoods	35.3	6.8	12.2	7.9	2.9	5.5	--	--	--	--	--
Hardwoods:											
Select white oaks	488.1	--	143.9	187.2	88.2	31.6	17.2	10.9	6.2	2.9	--
Other white oaks	211.8	--	79.4	76.4	28.4	17.7	3.6	4.9	1.4	--	--
Select red oaks	96.8	--	22.6	23.9	24.7	7.2	1.9	7.3	9.2	--	--
Red oaks	485.2	--	155.6	121.8	83.8	56.4	29.6	16.6	14.9	6.5	--
Other red oaks	30.6	--	6.4	6.0	4.1	2.8	3.9	2.2	5.2	--	--
Hickory A	39.9	--	13.4	9.1	5.9	9.5	2.0	--	--	--	--
Hickory B	34.0	--	16.0	7.6	5.3	2.2	1.5	--	1.4	--	--
Soft maple	8.4	--	1.4	--	--	--	7.0	--	--	--	--
Tupelo and blackgum	8.6	--	--	--	3.4	1.9	--	--	--	3.3	--
Ash	12.4	--	6.5	2.5	--	--	--	3.4	--	--	--
Sycamore	89.0	--	17.3	17.3	18.6	8.2	--	7.4	12.2	8.0	--
River birch	3.2	--	--	--	--	--	3.2	--	--	--	--
Black walnut	18.3	--	9.2	4.7	2.2	2.2	--	--	--	--	--
Black cherry	2.0	--	--	--	--	2.0	--	--	--	--	--
Elm	5.9	--	--	1.9	2.0	2.0	--	--	--	--	--
Other hardwoods	14.6	--	3.8	7.8	--	3.0	--	--	--	--	--
Total hardwoods	1,548.8	--	475.5	466.2	266.6	146.7	69.9	52.7	50.5	20.7	--
All species	1,584.1	6.8	487.7	474.1	269.5	152.2	69.9	52.7	50.5	20.7	--

1/ International 1/4-inch rule.

Table 27.—*Net volume of growing stock on commercial forest land, by species and forest type, Northwestern Ozarks, Missouri, 1972*

(Million cubic feet)

Species	All forest types	Eastern redcedar	Eastern redcedar-hardwood	Post-blackjack oak	Black-scarlet oak	White oak	Elm-ash-cottonwood	Maple-beech	Non-stocked
Softwoods:									
Shortleaf pine	4.2	--	--	--	4.2	--	--	--	--
Eastern redcedar	3.8	1.0	.8	1.0	.7	--	--	--	.3
Total softwoods	8.0	1.0	.8	1.0	4.9	--	--	--	.3
Hardwoods:									
Select white oaks	184.6	.1	.5	13.1	49.9	116.8	1.3	.4	2.5
Other white oaks	132.2	--	.6	100.7	19.7	6.0	1.6	--	3.6
Select red oaks	31.3	--	--	1.6	18.0	10.1	.3	--	1.3
Red oaks	196.8	--	1.1	30.3	140.6	20.1	.8	1.4	2.5
Other red oaks	13.9	--	--	6.5	4.0	.5	2.6	--	.3
Hickory A	22.1	--	--	4.9	11.7	2.6	2.9	--	--
Hickory B	29.2	--	--	16.8	8.8	2.8	--	.8	--
Hard maple	.3	--	--	--	.3	--	--	--	--
Soft maple	3.0	--	--	--	--	--	3.0	--	--
Tupelo and blackgum	2.9	--	--	--	1.6	1.3	--	--	--
Ash	5.8	--	--	.9	1.1	.9	2.9	--	--
Sycamore	28.0	--	.1	.2	2.8	2.6	22.3	--	--
River birch	.5	--	--	--	--	--	.5	--	--
Black walnut	9.3	.1	--	1.6	3.1	2.7	1.0	.2	.6
Black cherry	.7	--	--	--	.3	--	.4	--	--
Elm	4.3	--	--	--	1.6	1.0	1.7	--	--
Other hardwoods	5.9	--	.6	1.1	.3	.9	2.5	.2	.3
Total hardwoods	670.8	.2	2.9	177.7	263.8	168.3	43.8	3.0	11.1
All species	678.8	1.2	3.7	178.7	268.7	168.3	43.8	3.0	11.4

Table 28.--*Net volume of sawtimber on commercial forest land, by species and forest type, Northwestern Ozarks, Missouri, 1972*

(Million board feet)[1/]

Species	All forest types	Eastern redcedar	Eastern redcedar-hardwood	Post-blackjack oak	Black-scarlet oak	White oak	Elm-ash-cottonwood	Maple-beech	Non-stocked
Softwoods:									
Shortleaf pine	25.7	--	--	--	25.7	--	--	--	--
Eastern redcedar	9.6	2.9	.2	2.6	3.9	--	--	--	--
Total softwoods	35.3	2.9	.2	2.6	29.6	--	--	--	--
Hardwoods:									
Select white oaks	488.1	--	.9	42.5	133.2	296.1	6.6	2.0	6.8
Other white oaks	211.8	--	1.4	139.1	45.1	8.7	6.1	--	11.4
Select red oaks	96.8	--	--	4.3	58.0	29.7	1.4	--	3.4
Red oaks	485.2	--	.9	52.2	368.7	50.0	4.0	4.6	4.8
Other red oaks	30.6	--	--	7.5	9.2	--	12.1	--	1.8
Hickory A	39.9	--	.1	6.0	20.5	3.1	10.2	--	--
Hickory B	34.0	--	--	21.1	8.7	2.0	--	2.2	--
Soft maple	8.4	--	--	--	--	--	8.4	--	--
Tupelo and blackgum	8.6	--	--	--	3.3	5.3	--	--	--
Ash	12.4	--	--	1.4	--	1.3	9.7	--	--
Sycamore	89.0	--	--	--	9.3	7.2	72.5	--	--
River birch	3.2	--	--	--	--	--	3.2	--	--
Black walnut	18.3	.6	.1	3.3	6.5	3.4	--	--	4.4
Black cherry	2.0	--	--	--	--	--	2.0	--	--
Elm	5.9	--	--	--	2.0	--	3.9	--	--
Other hardwoods	14.6	--	1.2	1.1	3.0	2.9	6.4	--	--
Total hardwoods	1,548.8	.6	4.6	278.5	667.5	409.7	146.5	8.8	32.6
All species	1,584.1	3.5	4.8	281.1	697.1	409.7	146.5	8.8	32.6

1/ International 1/4-inch rule.

Table 29.--*Net volume of timber in cull trees on commercial forest land, by species and cull tree class, Northwestern Ozarks, Missouri, 1972*

(Million cubic feet)

Species	All cull trees	Rough trees	Short-log trees1/	Rotten trees
Softwoods:				
Eastern redcedar	1.6	1.5	.1	--
Total softwoods	1.6	1.5	.1	--
Hardwoods:				
Select white oaks	124.8	87.4	25.9	11.5
Other white oaks	136.2	106.5	15.7	14.0
Select red oaks	16.0	12.1	1.0	2.9
Red oaks	132.6	82.1	21.1	29.4
Other red oaks	39.0	28.0	4.0	7.0
Hickory A	12.0	9.8	1.1	1.1
Hickory B	20.5	16.7	2.3	1.5
Hard maple	1.0	.8	--	.2
Soft maple	3.3	2.2	--	1.1
Tupelo and blackgum	.1	--	--	.1
Ash	6.0	4.2	.8	1.0
Sycamore	3.4	.7	2.0	.7
River birch	.6	.2	--	.4
Black walnut	8.4	5.7	1.6	1.1
Black cherry	2.0	1.1	.9	--
Elm	7.1	5.0	1.2	.9
Other hardwoods	10.7	7.8	.6	2.3
Noncommercial species	.4	.3	--	.1
Total hardwoods	524.1	370.6	78.2	75.3
All species	525.7	372.1	78.3	75.3

1/ Volumes are for trees 9.0 inches d.b.h. and larger for softwoods and 11.0 inches d.b.h. and larger for hardwoods. Volumes for rough and rotten trees are for trees 5.0 inches d.b.h. and larger.

Table 30.--*Net volume of short-log trees on commercial forest land, by species and diameter class, Northwestern Ozarks, Missouri, 1972*

(Million board feet)[1/]

Species	All classes	Diameter class (inches at breast height)									
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-28.9	29.0-38.9	39.0+
Softwoods:											
Eastern redcedar	.6	.4	--	.2	--	--	--	--	--	--	--
Total softwoods	.6	.4	--	.2	--	--	--	--	--	--	--
Hardwoods:											
Select white oaks	87.4	--	30.4	20.8	12.3	10.1	4.0	2.3	5.1	2.4	--
Other white oaks	59.6	--	24.4	21.1	9.4	.9	1.8	2.0	--	--	--
Select red oaks	3.2	--	1.6	--	1.6	--	--	--	--	--	--
Red oaks	61.1	--	18.1	15.6	16.3	5.4	2.8	2.1	--	.8	--
Other red oaks	11.4	--	5.0	2.4	--	2.5	.7	--	.8	--	--
Hickory A	4.3	--	2.1	1.0	--	1.2	--	--	--	--	--
Hickory B	5.5	--	2.1	--	2.3	1.1	--	--	--	--	--
Ash	3.3	--	1.6	1.7	--	--	--	--	--	--	--
Sycamore	4.8	--	--	2.6	--	--	--	1.1	1.1	--	--
Black walnut	4.3	--	1.7	--	1.4	--	--	--	1.2	--	--
Black cherry	2.0	--	--	--	--	--	2.0	--	--	--	--
Elm	2.6	--	--	1.1	--	.8	.7	--	--	--	--
Other hardwoods	1.6	--	--	1.2	--	.4	--	--	--	--	--
Total hardwoods	251.1	--	87.0	67.5	43.3	22.4	12.0	7.5	8.2	3.2	--
All species	251.7	.4	87.0	67.7	43.3	22.4	12.0	7.5	8.2	3.2	--

1/ International 1/4-inch rule.

Table 31.—*Net volume of sawtimber on commercial forest land, by species and log grade class, Northwestern Ozarks, Missouri, 1972*

(Million board feet)[1/]

Species	All grades	Log Grade 1	Log Grade 2	Log Grade 3	Tie and timber
Softwoods:					
Shortleaf pine	25.7	1.2	2.1	22.4	--
Eastern redcedar	9.6	--	--	9.5	.1
Total softwoods	35.3	1.2	2.1	31.9	.1
Hardwoods:					
Select white oaks	488.1	16.7	93.4	274.0	104.0
Other white oaks	211.8	7.0	26.0	141.0	37.8
Select red oaks	96.8	7.9	23.3	42.6	23.0
Red oaks	485.2	28.0	121.0	257.0	79.2
Other red oaks	30.6	--	2.5	12.1	16.0
Hickory A	39.9	--	8.6	22.4	8.9
Hickory B	34.0	5.7	4.1	12.8	11.4
Soft maple	8.4	--	5.8	--	2.6
Tupelo and blackgum	8.6	.7	4.3	2.0	1.6
Ash	12.4	--	6.4	6.0	--
Sycamore	89.0	7.4	34.4	43.0	4.2
River birch	3.2	--	--	3.2	--
Black walnut	18.3	--	--	18.3	--
Black cherry	2.0	--	--	1.7	.3
Elm	5.9	--	--	5.9	--
Other hardwoods	14.6	--	6.6	6.9	1.1
Total hardwoods	1,548.8	73.4	336.4	848.9	290.1
All species	1,584.1	74.6	338.5	880.8	290.2

1/ International 1/4-inch rule.

Table 32.--*Walnut volume on nonforest land, by diameter class and class of timber, Northwestern Ozarks, Missouri, 1972*

Diameter class (inches at breast height)	Growing-stock trees	Sawtimber trees	Rough trees	Short-log trees	Rotten trees
	Thousand cubic feet	Thousand board feet[1/]	Thousand cubic feet	Thousand board feet[1/]	Thousand cubic feet
5.0-6.9	--	--	447.4	--	--
7.0-8.9	--	--	374.0	--	--
9.0-10.9	627.7	--	252.7	--	--
11.0-12.9	216.6	1,579.0	--	--	167.3
13.0-14.9	256.5	1,709.5	237.5	--	--
15.0-16.9	370.8	1,742.3	--	2,936.1	--
17.0-18.9	--	--	--	--	181.8
19.0-20.9	370.8	2,108.9	--	--	172.0
21.0-22.9	--	--	337.6	--	--
All diameters	1,842.4	7,139.7	1,649.2	2,936.1	521.1

1/ International 1/4-inch rule.

Table 33.—*Net annual growth of growing stock and sawtimber on commercial forest land, by species and county, Northwestern Ozarks, Missouri, 1971*

Species	All counties		Benton		Camden		Cedar		Dallas		Hickory		Laclede	
	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber
	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/	Cords	Thousand bd. ft.[1]/
Softwoods:														
Shortleaf pine	1,791	892	138	69	175	88	54	27	108	54	84	42	173	86
Eastern redcedar	2,938	156	237	10	350	20	107	3	187	10	137	5	323	18
Total softwoods	4,729	1,048	375	79	525	108	161	30	295	64	221	47	496	104
Hardwoods:														
Select white oaks	51,839	9,186	4,549	829	5,762	1,040	1,913	353	3,417	618	2,763	501	5,112	908
Other white oaks	32,867	2,431	2,783	224	3,604	269	1,181	98	2,130	168	1,696	137	3,338	231
Select red oaks	11,328	2,034	1,005	179	1,256	223	427	76	751	134	601	107	1,114	199
Red oaks	72,770	11,770	6,180	1,042	8,030	1,321	2,602	441	4,724	787	3,764	634	7,250	1,153
Other red oaks	3,692	192	320	23	374	10	139	11	245	17	204	17	360	14
Hickory A	5,649	606	510	56	614	63	233	26	395	44	339	38	538	57
Hickory B	8,699	533	732	47	971	59	311	20	564	36	451	29	869	52
Hard maple	44	--	4	--	5	--	2	--	3	--	2	--	4	--
Soft maple	1,332	418	161	50	101	32	79	25	112	35	79	25	97	30
Tupelo and blackgum	324	77	29	7	37	8	12	3	21	5	18	4	33	8
Ash	1,990	442	203	48	185	38	96	24	149	35	118	29	171	35
Sycamore	11,344	3,611	1,317	419	907	290	644	207	944	298	694	228	866	271
River birch	12	6	1	1	1	1	1	--	1	--	1	1	1	1
Black walnut	2,635	425	232	39	287	49	103	16	176	28	147	20	260	46
Black cherry	113	4	11	--	12	--	5	--	8	--	7	1	11	--
Elm	-234	-246	-6	-22	-42	-30	1	-9	-7	-16	-4	-12	-35	-26
Other hardwoods	2,965	580	327	62	262	54	141	28	221	47	138	29	293	58
Total hardwoods	207,369	32,069	18,358	3,004	22,366	3,427	7,890	1,319	13,854	2,236	11,018	1,788	20,282	3,037
All species	212,098	33,117	18,733	3,083	22,891	3,535	8,051	1,349	14,149	2,300	11,239	1,835	20,778	3,141

(Table 33 cont. on next page)

(Table 33 cont.)

Species	Maries		Miller		Morgan		Phelps		Polk		Pulaski		St. Clair	
	Growing stock	Saw-timber	Growing stock	Saw-timber	Growing stock	Saw-timber	Growing stock	Saw-timber	Growing stock	Saw-timber	Growing stock	Saw-timber	Growing stock	Saw-timber
	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/	Cords	Thousand bd. ft.1/
Softwoods:														
Shortleaf pine	143	71	148	74	161	80	279	138	69	34	163	81	96	48
Eastern redcedar	191	8	210	8	242	15	355	26	187	19	248	9	164	5
Total softwoods	334	79	358	82	403	95	634	164	256	53	411	90	260	53
Hardwoods:														
Select white oaks	3,681	632	4,180	736	4,713	826	5,810	975	2,103	370	4,618	805	3,218	593
Other white oaks	2,456	160	2,646	193	2,889	229	3,794	248	1,339	99	3,039	211	1,972	164
Select red oaks	792	149	905	165	1,015	180	1,262	226	467	83	1,012	184	721	129
Red oaks	5,334	788	5,793	920	6,515	1,081	8,633	1,348	2,937	474	6,659	1,039	4,349	742
Other red oaks	261	4	302	18	310	15	411	7	167	13	339	15	260	28
Hickory A	354	35	436	46	473	49	543	57	261	29	513	54	440	52
Hickory B	665	38	691	42	769	49	1,009	60	345	21	808	47	514	33
Hard maple	3	--	3	--	4	--	5	--	2	--	4	--	3	--
Soft maple	56	18	131	41	82	26	67	21	101	32	105	33	161	50
Tupelo and blackgum	24	6	26	6	29	7	35	8	12	3	28	7	20	5
Ash	114	20	173	39	143	29	157	27	118	30	172	37	191	51
Sycamore	495	153	1,068	336	725	229	623	193	815	261	912	292	1,334	434
River birch	--	--	1	--	1	--	--	--	1	1	1	--	2	1
Black walnut	177	28	206	34	218	34	275	44	123	22	240	37	191	28
Black cherry	6	--	8	--	10	1	12	--	5	--	10	1	8	1
Elm	-22	-14	-10	-17	-35	-26	-66	-34	2	-8	-26	-21	16	-11
Other hardwoods	201	35	261	49	194	40	231	45	173	32	228	46	295	55
Total hardwoods	14,597	2,052	16,820	2,608	18,055	2,769	22,801	3,225	8,971	1,462	18,662	2,787	13,695	2,355
All species	14,931	2,131	17,178	2,690	18,458	2,864	23,435	3,389	9,227	1,515	19,073	2,877	13,955	2,408

1/ International 1/4-inch rule.

Table 34.--*Timber removals from growing stock and sawtimber on commercial forest land, by item and species group, Northwestern Ozarks, Missouri, 1971*[1/]

Item	Growing stock					Sawtimber				
	All species	Shortleaf pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Shortleaf pine	Other softwoods	Soft hardwoods	Hard hardwoods
	Cords					Thousand board feet[2/]				
Roundwood products:										
Saw logs	33,390	28	919	7,836	24,607	13,499	13	329	3,934	9,223
Cooperage logs	8,532	--	--	--	8,532	4,055	--	--	--	4,055
Veneer logs	392	--	--	--	392	145	--	--	--	145
Charcoal wood	16,570	--	--	253	16,317	1,928	--	--	37	1,891
Posts	1,949	--	--	177	1,772	454	--	--	47	407
Poles	--	--	--	--	--	1	1	--	--	--
Fuelwood	18,605	--	23	1,785	16,797	3,503	--	3	337	3,163
Mine timbers	89	--	--	--	89	8	--	--	--	8
Miscellaneous[3/]	4,008	--	1,906	1,304	798	1,727	--	822	562	343
All products	83,535	28	2,848	11,355	69,304	25,320	14	1,154	4,917	19,235
Logging residues	11,238	6	169	987	10,076	1,461	1	55	157	1,248
Other removals	65,240	--	--	11,583	53,657	7,443	--	--	1,321	6,122
Total removals	160,013	34	3,017	23,925	133,037	34,224	15	1,209	6,395	26,605

1/ See glossary for timber removals from growing stock (page 5).
2/ International 1/4-inch rule.
3/ Includes shaving wood, heading bolts, etc.

Table 35.—*Timber removals from growing stock and sawtimber on commercial forest land, by species and county, Northwestern Ozarks, Missouri, 1971*

Species	All counties		Benton		Camden		Cedar		Dallas	
	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber
	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]
Softwoods:										
Shortleaf pine	34	15	--	--	--	--	--	--	--	--
Eastern redcedar	3,017	1,209	586	237	11	1	--	--	--	--
Total softwoods	3,051	1,224	586	237	11	1	--	--	--	--
Hardwoods:										
Select white oaks	31,208	7,590	1,173	277	1,536	413	464	79	1,457	398
Other white oaks	41,890	6,855	2,811	410	3,633	541	1,178	158	2,434	406
Select red oaks	2,238	558	15	3	147	43	28	7	127	36
Red oaks	42,775	8,363	1,632	205	3,573	707	944	151	2,566	549
Hickory B	8,911	1,710	433	62	572	88	174	24	308	43
Hard maple	431	165	--	--	--	--	--	--	76	29
Soft maple	1,873	846	13	8	468	213	13	6	468	213
Tupelo and blackgum	25	4	--	--	--	--	--	--	--	--
Ash	1,546	571	--	1	228	89	--	1	228	89
Sycamore	6,938	3,133	38	18	367	162	89	40	304	146
Cottonwood	684	324	--	1	--	--	--	1	--	--
River birch	25	18	--	--	--	--	--	--	--	--
Black walnut	4,013	775	435	96	309	38	268	66	192	26
Black cherry	76	46	--	--	--	--	--	--	--	--
Elm	10,167	1,321	919	113	919	97	486	84	706	96
Other hardwoods	4,162	721	437	77	314	38	165	23	303	60
Total hardwoods	156,962	33,000	7,906	1,271	12,066	2,429	3,809	640	9,169	2,091
All species	160,013	34,224	8,492	1,508	12,077	2,430	3,809	640	9,169	2,091

(Table 35 cont. on next page)

(Table 35 cont.)

Species	Hickory		Laclede		Maties		Miller		Morgan	
	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber
	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]
Softwoods:										
Shortleaf pine	--	--	--	--	--	1	--	--	--	--
Eastern redcedar	649	259	--	--	6	3	1,179	472	242	98
Total softwoods	649	259	--	--	6	4	1,179	472	242	98
Hardwoods:										
Select white oaks	860	205	2,820	769	8,499	1,756	2,260	599	1,993	581
Other white oaks	1,788	270	4,061	679	6,285	1,105	3,233	541	3,312	574
Select red oaks	15	4	175	49	299	59	73	14	20	5
Red oaks	1,062	148	3,707	758	4,665	812	2,185	314	1,763	230
Hickory B	272	45	933	234	1,624	229	716	105	396	53
Hard maple	--	--	253	93	--	--	--	--	--	--
Soft maple	--	--	25	14	215	98	228	101	405	173
Tupelo and blackgum	--	--	--	--	25	2	--	--	--	--
Ash	--	--	127	51	468	163	228	72	203	83
Sycamore	38	20	101	49	1,987	918	304	121	886	379
Cottonwood	13	6	--	--	620	290	--	2	38	17
River birch	--	--	--	--	--	--	--	--	--	--
Black walnut	223	43	294	43	363	85	272	45	299	53
Black cherry	--	--	25	15	51	30	--	--	--	--
Elm	587	82	913	129	749	80	876	109	755	79
Other hardwoods	185	33	315	41	341	50	294	41	584	176
Total hardwoods	5,043	856	13,749	2,924	26,191	5,677	10,669	2,064	10,654	2,403
All species	5,692	1,115	13,749	2,924	26,197	5,681	11,848	2,536	10,896	2,501

(Table 35 cont. on next page)

(Table 35 cont.)

Species	Phelps		Polk		Pulaski		St. Clair	
	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber	Growing stock	Sawtimber
	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]	Cords	Thousand bd. ft.[1]
Softwoods:								
Shortleaf pine	--	--	--	--	34	14	--	--
Eastern redcedar	11	2	--	--	333	137	--	--
Total softwoods	11	2	--	--	367	151	--	--
Hardwoods:								
Select white oaks	4,188	994	1,202	286	4,014	1,058	742	175
Other white oaks	5,101	819	1,666	266	4,439	803	1,949	283
Select red oaks	711	158	29	7	550	160	49	13
Red oaks	10,192	2,040	1,025	157	7,874	2,017	1,587	275
Hickory B	1,535	355	226	31	1,447	402	275	39
Hard maple	13	6	89	37	--	--	--	--
Soft maple	13	5	--	--	--	--	25	15
Tupelo and blackgum	--	2	--	--	--	--	--	--
Ash	13	7	--	--	38	9	13	6
Sycamore	1,557	718	89	42	975	431	203	89
Cottonwood	--	3	--	--	--	--	13	4
River birch	25	16	--	--	--	--	--	2
Black walnut	289	35	509	155	271	35	289	55
Black cherry	--	1	--	--	--	--	--	--
Elm	871	91	551	82	922	116	913	163
Other hardwoods	351	58	230	31	344	50	299	43
Total hardwoods	24,859	5,308	5,616	1,094	20,874	5,081	6,357	1,162
All species	24,870	5,310	5,616	1,094	21,241	5,232	6,357	1,162

1/ International 1/4-inch rule.

Table 36.—*Annual mortality of growing stock and sawtimber on commercial forest land, by cause and softwoods and hardwoods, Northwestern Ozarks, Missouri, 1971*

Cause	Growing stock			Sawtimber		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	Thousand cubic feet			Thousand board feet[1/]		
Disease	369	--	369	1,408	--	1,408
Suppression	185	--	185	--	--	--
Unknown and other	81	--	81	--	--	--
Logging	104	--	104	554	--	554
All causes	739	--	739	1,962	--	1,962

1/ International 1/4-inch rule.

Table 37.--*Annual mortality of growing stock and sawtimber on commercial forest land, by species, Northwestern Ozarks, Missouri, 1971*

Species	Growing stock	Sawtimber
	Thousand cubic feet	Thousand board feet[1/]
Hardwoods:		
Select white oaks	69	--
Select red oaks	113	554
Red oaks	185	554
Other red oaks	87	473
Sycamore	116	--
Elm	169	381
Total hardwoods	739	1,962

1/ International 1/4-inch rule.

Table 38.--*Output of timber products by source of material and softwoods and hardwoods, Northwestern Ozarks, Missouri, 1969*

Product and species group	Standard unit[1/]	Total		Roundwood products				Plant byproducts	
				Growing stock		Nongrowing stock			
		No. of units	M cu. ft.	No. of units	M cu. ft.	No. of units	M cu. ft.	No. of units	M cu. ft.
Saw logs:	M bd. ft.								
Softwood		802	168	802	168	--	--	--	--
Hardwood		20,615	3,594	14,674	2,563	5,941	1,031	--	--
Total		21,417	3,762	15,476	2,731	5,941	1,031	--	--
Veneer logs:	M bd. ft.								
Softwood		--	--	--	--	--	--	--	--
Hardwood		222	49	140	31	82	18	--	--
Total		222	49	140	31	82	18	--	--
Cooperage logs:	M bd. ft.								
Softwood		--	--	--	--	--	--	--	--
Hardwood		4,518	744	4,093	674	425	70	--	--
Total		4,518	744	4,093	674	425	70	--	--
Pulpwood:	Std. cords								
Softwood		--	--	--	--	--	--	--	--
Hardwood		1,278	101	--	--	--	--	1,278	101
Total		1,278	101	--	--	--	--	1,278	101
Poles:	M pieces								
Softwood		200	--	200	--	--	--	--	--
Hardwood		--	--	--	--	--	--	--	--
Total		200	--	200	--	--	--	--	--
Mine timbers:	M cu. ft.								
Softwood		--	--	--	--	--	--	--	--
Hardwood		10	10	7	7	3	3	--	--
Total		10	10	7	7	3	3	--	--
Posts:	M pieces								
Softwood		4	--	3	--	1	--	--	--
Hardwood		395	213	291	154	104	59	--	--
Total		399	213	294	154	105	59	--	--
Charcoal wood:	Std. cords								
Softwood		--	--	--	--	--	--	--	--
Hardwood		62,472	4,362	18,750	1,309	40,208	2,807	3,514	246
Total		62,472	4,362	18,750	1,309	40,208	2,807	3,514	246
Other:[2/]	M cu. ft.								
Softwood		386	386	338	338	--	--	48	48
Hardwood		283	283	166	166	--	--	117	117
Total		669	669	504	504	--	--	165	165
Fuelwood:	Std. cords								
Softwood		134	10	54	4	80	6	--	--
Hardwood		74,405	4,825	22,639	1,468	48,827	3,166	2,939	191
Total		74,539	4,835	22,693	1,472	48,907	3,172	2,939	191
All products:	M cu. ft.								
Softwood		564	564	510	510	6	6	48	48
Hardwood		14,181	14,181	6,372	6,372	7,154	7,154	655	655
Total		14,745	14,745	6,882	6,882	7,160	7,160	703	703

1/ M (meaning thousand) board feet by International 1/4-inch rule. Cords are on a roughwood, 128-cubic-foot basis.
2/ Other (industrial production) includes handle bolts, shaving bolts, heading stock, etc.

Table 39.--*Forest products harvested by ownership class and product, Northwestern Ozarks, Missouri, 1969*

Ownership class	Saw logs	Cooperage logs	Veneer logs	Pulp-wood	Charcoal wood	Posts	Fuel-wood	Poles	Mine timbers	Handle bolts	Miscellaneous
	M bd.ft.[1]	M bd.ft.[1]	M bd.ft.[1]	Cords[2]	Cords[2]	M pieces	Cords[2]	Pieces	M cu.ft.	M bd.ft.[1]	M cu.ft.
Federal:											
National Forest:											
Softwoods	16	--	--	--	--	--	--	200	--	--	--
Hardwoods	2,506	--	24	--	1,248	1	40	--	--	--	--
U.S. Army:											
Hardwoods	475	--	--	--	--	--	--	--	--	--	--
Corps of Engineers:											
Hardwoods	95	--	--	--	--	--	--	--	--	--	--
Total	3,092	--	24	--	1,248	1	40	200	--	--	--
State:											
Softwoods	--	--	--	--	--	1	--	--	--	--	--
Hardwoods	--	--	--	--	24	--	--	--	--	--	--
Total	--	--	--	--	24	1	--	--	--	--	--
Private:											
Industrial:											
Hardwoods	12	--	--	--	10	--	--	--	--	--	--
Farm and other:											
Softwoods	786	--	--	--	--	3	134	--	--	--	338
Hardwoods	17,527	4,518	198	--	57,676	394	71,426	--	10	--	166
Total	18,325	4,518	198	--	57,686	397	71,560	--	10	--	504
All owners:											
Softwoods	802	--	--	--	--	4	134	200	--	--	338
Hardwoods	20,615	4,518	222	--	58,958	395	71,466	--	10	--	166
Total	21,417	4,518	222	--	58,958	399	71,600	200	10	--	504

1/ International 1/4-inch rule.
2/ Standard cords, rough wood basis.

Table 40.--*Volume of primary plant residue, by kind of material and type of use, Northwestern Ozarks, Missouri, 1969*

(Thousand cubic feet)

Source industry and kind of residue	Volume by type of use								
	Fiber[1]		Charcoal		Fuel[2]		Other[3]		Not used[4]	
	Hard-woods	Soft-woods	Hard-woods	Soft-woods	Hard-woods	Soft-woods	Hard-woods	Soft-woods	Hard-woods	Soft-woods
Lumber:										
Coarse	22	--	246	--	141	30	--	3	73	--
Fine	--	--	--	--	13	18	84	2	235	--
Total	22	--	246	--	154	48	84	5	308	--
All other:										
Coarse	79	--	--	--	4	--	--	--	--	--
Fine	--	--	--	--	33	--	33	--	72	--
Total	79	--	--	--	37	--	33	--	72	--
All industries:										
Coarse	101	--	246	--	145	30	--	3	73	--
Fine	--	--	--	--	46	18	117	2	307	--
Total	101	--	246	--	191	48	117	5	380	--

1/ For manufacture of pulp, hardboard, or roofing felt.
2/ All residue used for industrial or domestic fuel whether sold or given away.
3/ Includes uses such as livestock bedding, mulch, small dimension, and specialty items.
4/ Includes residue burned as waste.

Table 41.--*Timber products output from roundwood, by species and product, Northwestern Ozarks, Missouri, 1969*

Species	Saw logs		Veneer logs		Cooperage logs		Charcoal wood		Other products[3]	All products
	M bd. ft.[1]	M cu. ft.	M bd. ft.[1]	M cu. ft.	M bd. ft.[1]	M cu. ft.	Cords[2]	M cu. ft.	M cu. ft.	M cu. ft.
Softwoods:										
Shortleaf pine	30	5	0	0	0	0	0	0	0	5
Eastern redcedar	772	163	0	0	0	0	0	0	348	511
Total softwoods	802	168	0	0	0	0	0	0	348	516
Hardwoods:										
White oaks	4,460	796	0	0	4,518	744	29,737	2,079	3,394	7,013
Red oaks	2,361	420	0	0	0	0	3,169	221	270	911
Black oak	7,036	1,253	0	0	0	0	17,560	1,229	567	3,049
Hickory	774	131	74	16	0	0	6,842	481	220	848
Hard maple	156	25	0	0	0	0	13	0	0	25
Soft maple	783	122	0	0	0	0	15	0	26	148
Blackgum	2	0	0	0	0	0	67	5	0	5
Ash	460	77	0	0	0	0	496	33	12	122
Cottonwood	294	45	0	0	0	0	0	0	3	48
Black walnut	841	182	148	33	0	0	36	1	0	216
Black cherry	49	7	0	0	0	0	43	2	0	9
Elm	126	20	0	0	0	0	634	43	233	296
Birch	20	2	0	0	0	0	0	0	0	2
Sycamore	3,121	494	0	0	0	0	346	22	74	590
Other hardwoods	132	20	0	0	0	0	0	0	224	244
Total hardwoods	20,615	3,594	222	49	4,518	744	58,958	4,116	5,023	13,526
All species	21,417	3,762	222	49	4,518	744	58,958	4,116	5,371	14,042

1/ International 1/4-inch rule.
2/ Standard cords, rough wood basis.
3/ Includes posts, fuelwood, shaving bolts, heading bolts, etc.

Table 42.--*Average annual allowable cut for 1972-1981 from harvest cuttings and thinnings on commercial forest land, by species and kind of material, Northwestern Ozarks, Missouri*

Species	Growing stock[1]			Sawtimber[1]	Rough and rotten trees		
	Total	Poletimber trees	Sawtimber trees	Total	Total	Short-log trees	Other
	Cords			Thousand board feet[2]	Cords		
Softwoods:							
Shortleaf pine	848	--	848	480	63	--	63
Eastern redcedar	89	38	51	23	--	--	--
Total softwoods	937	38	899	503	63	--	63
Hardwoods:							
Select white oaks	68,354	17,012	51,342	18,999	42,519	9,190	33,329
Other white oaks	45,114	15,582	29,532	10,717	31,114	5,291	25,823
Select red oaks	14,152	5,051	9,101	3,368	4,012	544	3,468
Red oaks	47,759	6,974	40,785	15,518	34,873	7,076	27,797
Other red oaks	2,494	1,697	797	272	9,240	974	8,266
Hickory A	10,165	4,456	5,709	1,949	3,646	380	3,266
Hickory B	11,139	7,519	3,620	1,373	5,013	785	4,228
Hard maple	--	--	--	--	241	1	240
Soft maple	747	--	747	354	1,519	--	1,519
Tupelo and blackgum	1,329	721	608	221	--	--	--
Ash	2,443	557	1,886	694	2,646	633	2,013
Sycamore	5,532	1,330	4,202	1,671	1,392	911	481
Black walnut	1,354	936	418	156	1,722	494	1,228
Black cherry	--	--	--	--	532	--	532
Elm	1,304	1,051	253	89	1,253	--	1,253
Other hardwoods	1,722	735	987	363	2,911	--	2,911
Total hardwoods	213,608	63,621	149,987	55,744	142,633	26,279	116,354
All species	214,545	63,659	150,886	56,247	142,696	26,279	116,417

1/ Cuttings of less than 3 cords per acre, or the equivalent in board feet, are excluded.
2/ International 1/4-inch rule.

Table 43.--*Average annual allowable cut of growing stock for 1972-1981 from harvest cuttings and thinnings on commercial forest land, by species and forest type, Northwestern Ozarks, Missouri* 1/

(Thousand cubic feet)

Species	All forest types	Eastern redcedar-hardwood	Post-blackjack oak	Black-scarlet oak	White oak	Elm-ash-cottonwood	Maple-beech
Softwoods:							
Shortleaf pine	67	--	--	67	--	--	--
Eastern redcedar	7	7	--	--	--	--	--
Total softwoods	74	7	--	67	--	--	--
Hardwoods:							
Select white oaks	5,400	--	557	1,677	3,107	59	--
Other white oaks	3,564	2	3,140	348	74	--	--
Select red oaks	1,118	--	59	761	298	--	--
Red oaks	3,773	--	586	2,740	429	18	--
Other red oaks	197	--	118	57	--	22	--
Hickory A	803	3	105	353	90	252	--
Hickory B	880	--	593	199	88	--	--
Soft maple	59	--	--	--	--	59	--
Tupelo and blackgum	105	--	--	57	48	--	--
Ash	193	--	--	--	42	151	--
Sycamore	437	7	--	86	55	289	--
Black walnut	107	2	--	2	103	--	--
Elm	103	--	--	64	--	39	--
Other hardwoods	136	9	--	--	56	71	--
Total hardwoods	16,875	23	5,158	6,344	4,390	960	--
All species	16,949	30	5,158	6,411	4,390	960	--

1/ Cuttings of less than 240 cubic feet per acre are excluded.

Table 44.--*Average annual allowable cut of growing stock for 1972-1981 from harvest cuttings and thinnings on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand cubic feet)

Species	All classes	Stand-volume class[1/] (cubic feet per acre)				
		240-399	400-799	800-1,199	1,200-1,599	1,600+
Softwoods:						
Shortleaf pine	67	--	--	67	--	--
Eastern redcedar	7	--	--	7	--	--
Total softwoods	74	--	--	74	--	--
Hardwoods:						
Select white oaks	5,400	327	2,051	1,238	1,784	--
Other white oaks	3,564	153	1,957	297	204	953
Select red oaks	1,118	57	472	416	173	--
Red oaks	3,773	367	1,701	1,495	210	--
Other red oaks	197	22	134	41	--	--
Hickory A	803	19	263	485	36	--
Hickory B	880	124	654	36	66	--
Soft maple	59	--	--	59	--	--
Tupelo and blackgum	105	--	48	57	--	--
Ash	193	73	42	78	--	--
Sycamore	437	7	279	151	--	--
Black walnut	107	2	38	31	36	--
Elm	103	--	20	19	64	--
Other hardwoods	136	38	56	42	--	--
Total hardwoods	16,875	1,189	7,715	4,445	2,573	953
All species	16,949	1,189	7,715	4,519	2,573	953

1/ Cuttings of less than 240 cubic feet per acre are excluded.

Table 45.—*Average annual allowable cut by harvest cuttings of growing stock for 1972-1981 on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand cubic feet)

Species	All classes	Stand-volume class[1/] (cubic feet per acre)				
		240-399	400-799	800-1,199	1,200-1,599	1,600+
Softwoods:						
Shortleaf pine	67	--	--	67	--	--
Eastern redcedar	7	--	--	7	--	--
Total softwoods	74	--	--	74	--	--
Hardwoods:						
Select white oaks	5,056	299	1,913	1,060	1,784	--
Other white oaks	3,537	153	1,941	286	204	953
Select red oaks	1,080	57	434	416	173	--
Red oaks	3,624	287	1,644	1,483	210	--
Other red oaks	197	22	134	41	--	--
Hickory A	798	14	263	485	36	--
Hickory B	857	124	643	24	66	--
Soft maple	59	--	--	59	--	--
Tupelo and blackgum	105	--	48	57	--	--
Ash	193	73	42	78	--	--
Sycamore	437	7	279	151	--	--
Black walnut	105	2	36	31	36	--
Elm	103	--	20	19	64	--
Other hardwoods	136	38	56	42	--	--
Total hardwoods	16,287	1,076	7,453	4,232	2,573	953
All species	16,361	1,076	7,453	4,306	2,573	953

1/ Cuttings of less than 240 cubic feet per acre are excluded.

Table 46.--*Average annual allowable cut by thinnings of growing stock for 1972-1981 on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand cubic feet)

Species	All classes	Stand-volume class[1/] (cubic feet per acre)		
		240-399	400-799	800-1,199
Hardwoods:				
Select white oaks	344	28	138	178
Other white oaks	27	--	16	11
Select red oaks	38	--	38	--
Red oaks	149	80	57	12
Hickory A	5	5	--	--
Hickory B	23	--	11	12
Black walnut	2	--	2	--
Total hardwoods	588	113	262	213
All species	588	113	262	213

1/ Cuttings of less than 240 cubic feet per acre are excluded.

Table 47.--*Average annual allowable cut of sawtimber*[1] *for 1972-1981, from harvest cuttings and thinnings on commercial forest land, by species and forest type, Northwestern Ozarks, Missouri*

(Thousand board feet)[2]

Species	All forest types	Eastern redcedar	Eastern redcedar-hardwood	Post-blackjack oak	Black-scarlet oak	White oak	Elm-ash-cottonwood	Maple-beech
Softwoods:								
Shortleaf pine	480	--	--	--	480	--	--	--
Eastern redcedar	87	64	23	--	--	--	--	--
Total softwoods	567	64	23	--	480	--	--	--
Hardwoods:								
Select white oaks	19,124	--	23	2,507	5,465	10,836	293	--
Other white oaks	10,771	--	35	9,380	1,253	103	--	--
Select red oaks	3,376	--	--	251	2,480	645	--	--
Red oaks	15,747	--	--	1,770	12,076	1,712	88	101
Other red oaks	272	--	--	162	--	--	110	--
Hickory A	1,959	--	15	368	774	--	802	--
Hickory B	1,421	--	--	1,019	354	--	--	48
Soft maple	354	--	--	--	--	--	354	--
Tupelo and blackgum	233	--	--	--	12	221	--	--
Ash	694	--	--	--	--	88	606	--
Sycamore	1,671	--	--	--	395	270	1,006	--
Black walnut	165	9	7	--	--	149	--	--
Elm	89	--	--	--	--	--	89	--
Other hardwoods	385	--	53	--	--	186	146	--
Total hardwoods	56,261	9	133	15,457	22,809	14,210	3,494	149
All species	56,828	73	156	15,457	23,289	14,210	3,494	149

1/ Cuttings of less than 3 cords per acre, or the equivalent in board feet, are included.
2/ International 1/4-inch rule.

Table 48.--*Average annual allowable cut of sawtimber*[1] *for 1972-1981, from harvest cuttings and thinnings on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand board feet)[2]

Species	All classes	Stand-volume class (board feet per acre)			
		0-1,499	1,500-2,499	2,500-4,999	5,000-7,499
Softwoods:					
Shortleaf pine	480	--	--	480	--
Eastern redcedar	87	87	--	--	--
Total softwoods	567	87	--	480	--
Hardwoods:					
Select white oaks	19,124	6,087	3,989	9,048	--
Other white oaks	10,771	3,782	2,733	643	3,613
Select red oaks	3,376	483	1,136	1,757	--
Red oaks	15,747	5,181	3,900	6,666	--
Other red oaks	272	272	--	--	--
Hickory A	1,959	370	1,174	415	--
Hickory B	1,421	1,176	245	--	--
Soft maple	354	--	354	--	--
Tupelo and blackgum	233	12	--	221	--
Ash	694	324	370	--	--
Sycamore	1,671	465	1,206	--	--
Black walnut	165	165	--	--	--
Elm	89	89	--	--	--
Other hardwoods	385	239	146	--	--
Total hardwoods	56,261	18,645	15,253	18,750	3,613
All species	56,828	18,732	15,253	19,230	3,613

1/ Cuttings of less than 3 cords per acre, or the equivalent in board feet, are included.

2/ International 1/4-inch rule.

Table 49.--*Average annual allowable cut by harvest cuttings of sawtimber*[1] *for 1972-1981 on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand board feet)[2]

Species	All classes	Stand-volume class (board feet per acre)			
		0-1,499	1,500-2,499	2,500-4,999	5,000-7,499
Softwoods:					
Shortleaf pine	480	--	--	480	--
Eastern redcedar	87	87	--	--	--
Total softwoods	567	87	--	480	--
Hardwoods:					
Select white oaks	18,501	5,464	3,989	9,048	--
Other white oaks	10,771	3,782	2,733	643	3,613
Select red oaks	3,246	353	1,136	1,757	--
Red oaks	15,386	4,820	3,900	6,666	--
Other red oaks	272	272	--	--	--
Hickory A	1,959	370	1,174	415	--
Hickory B	1,421	1,176	245	--	--
Soft maple	354	--	354	--	--
Tupelo and blackgum	233	12	--	221	--
Ash	694	324	370	--	--
Sycamore	1,671	465	1,206	--	--
Black walnut	165	165	--	--	--
Elm	89	89	--	--	--
Other hardwoods	385	239	146	--	--
Total hardwoods	55,147	17,531	15,253	18,750	3,613
All species	55,714	17,618	15,253	19,230	3,613

1/ Cuttings of less than 3 cords per acre, or the equivalent in board feet, are included.

2/ International 1/4-inch rule.

Table 50.--*Average annual allowable cut by thinnings of sawtimber*[1] *for 1972-1981 on commercial forest land, by species and stand-volume class, Northwestern Ozarks, Missouri*

(Thousand board feet)[2]

Species	All classes	Stand-volume class (board feet per acre)
		0-1,499
Hardwoods:		
Select white oaks	623	623
Select red oaks	130	130
Red oaks	361	361
Total hardwoods	1,114	1,114
All species	1,114	1,114

1/ Cuttings of less than 3 cords per acre, or the equivalent in board feet, are included.

2/ International 1/4-inch rule.

Table 51.--*Area of allowable cut*[1/] *by harvest cuttings on commercial forest land for 1972-1981, by forest type and stand-age class, Northwestern Ozarks, Missouri*

(Thousand acres)

Forest type	All ages	Stand-age class (years)										
		10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-119	120-139
Eastern redcedar-hardwood	.7	--	--	--	--	.3	.4	--	--	--	--	--
Shortleaf pine-oak	6.8	6.0	--	--	--	.4	.4	--	--	--	--	--
Post-blackjack oak	127.1	--	--	--	--	--	40.7	21.6	21.6	32.4	10.8	--
Black-scarlet oak	105.6	--	--	--	--	--	.8	27.5	22.0	38.7	16.6	--
White oak	62.2	--	--	--	--	--	--	28.4	17.0	11.2	--	5.6
Elm-ash-cottonwood	12.8	--	--	--	--	--	7.1	--	5.7	--	--	--
Maple-beech	1.2	--	--	--	--	--	1.2	--	--	--	--	--
All forest types	316.4	6.0	--	--	--	.7	50.6	77.5	66.3	82.3	27.4	5.6

1/ For a 10-year period.

Table 52.--*Area of allowable cut*[1/] *by thinnings on commercial forest land for 1972-1981, by forest type and stand-age class, Northwestern Ozarks, Missouri*

(Thousand acres)

Forest type	All ages	Stand-age class (years)					
		10-19	20-29	30-39	40-49	50-59	60-69
Black-scarlet oak	48.9	5.7	17.3	5.8	14.5	5.6	--
White oak	22.8	--	5.6	6.0	5.6	--	5.6
Elm-ash-cottonwood	5.9	--	--	--	--	5.9	--
All forest types	77.6	5.7	22.9	11.8	20.1	11.5	5.6

1/ For a 10-year period.

PRINCIPAL TREE SPECIES IN MISSOURI'S NORTHWESTERN OZARKS UNIT[3/]

SOFTWOOD SPECIES

Shortleaf pine . . . . . *Pinus echinata*
Eastern redcedar . . . . . *Juniperus virginiana*

HARD HARDWOOD SPECIES

Ashes:
- White ash . . . . . *Fraxinus americana*
- Green ash . . . . . *Fraxinus pennsylvanica*
- Blue ash . . . . . *Fraxinus quadrangulata*

Black walnut . . . . . *Juglans nigra*

Hard maples:
- Sugar maple . . . . . *Acer saccharum*

Hickory group A:
- Pecan . . . . . *Carya illinoensis*
- Shellbark hickory . . . . . *Carya laciniosa*
- Shagbark hickory . . . . . *Carya ovata*
- Mockernut hickory . . . . . *Carya tomentosa*

Hickory group B:
- Bitternut hickory . . . . . *Carya cordiformis*
- Pignut hickory . . . . . *Carya glabra* var. *glabra*
- Black hickory . . . . . *Carya texana*

River birch . . . . . *Betula nigra*

Select white oaks:
- White oak . . . . . *Quercus alba*
- Bur oak . . . . . *Quercus macrocarpa*
- Swamp chestnut oak . . . . . *Quercus michauxii*
- Chinkapin oak . . . . . *Quercus muehlenbergii*

White oaks:
- Swamp white oak . . . . . *Quercus bicolor*

Other white oaks:
- Post oak . . . . . *Quercus stellata* var. *stellata*

Select red oaks:
- Northern red oak . . . . . *Quercus rubra*
- Shumard oak . . *Quercus shumardii* var. *shumardii*

Red oaks:
- Scarlet oak . . . . . *Quercus coccinea*
- Southern red oak . . *Quercus falcata* var. *falcata*
- Black oak . . . . . *Quercus velutina*

Other red oaks:
- Shingle oak . . . . . *Quercus imbricaria*
- Blackjack oak . . . . . *Quercus marilandica*
- Pin oak . . . . . *Quercus palustris*
- Willow oak . . . . . *Quercus phellos*

Other hard hardwoods:
- Black locust . . . . . *Robinia pseudoacacia*
- Common persimmon . . . . . *Diospyros virginiana*
- Flowering dogwood . . . . . *Cornus florida*
- Honeylocust . . . . . *Gleditsia triacanthos*
- Osage-orange . . . . . *Maclura pomifera*
- Red mulberry . . . . . *Morus rubra*
- Sugarberry . . . . . *Celtis laevigata*

SOFT HARDWOOD SPECIES

American sycamore . . . . . *Platanus occidentalis*
Black cherry . . . . . *Prunus serotina*
Butternut . . . . . *Juglans cinerea*

Elms:
- American elm . . . . . *Ulmus americana*
- Slippery elm . . . . . *Ulmus rubra*

Soft maples:
- Red maple . . . . . *Acer rubrum* var. *rubrum*
- Silver maple . . . . . *Acer saccharinum*

Sweetgum . . . . . *Liquidambar styraciflua*

Tupelo and blackgum:
- Blackgum . . . . . *Nyssa sylvatica* var. *biflora*

Other soft hardwoods:
- Black willow . . . . . *Salix nigra*
- Boxelder . . . . . *Acer negundo*
- Hackberry . . . . . *Celtis occidentalis*
- Kentucky coffeetree . . . . . *Gymnocladus dioicus*
- Sassafras . . . . . *Sassafras albidum*

3/ The common and scientific names are based on "Check List of Native and Naturalized Trees of the United States (Including Alaska)," by Elbert L. Little, Jr., U.S. Dep. Agric., Agric. Handb. 41, 472 p. 1953.

APPENDIX

ACCURACY OF SURVEY

Forest survey information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. However, a measure of reliability of these figures is given by sampling errors. These sampling errors may be interpreted as meaning that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated area of commercial forest land in the Northwestern Ozarks Unit in 1972, 1,920.0 thousand acres, has a sampling errors of ±2.4 percent (±46.1 thousand acres). The commercial forest area from a 100-percent inventory, then, would be expected to fall between 1,873.9 and 1,966.1 thousand acres (1,920.0 ± 46.1), there being a one-in-three chance that this is not the case.

Following are sampling errors for total estimated volume, net growth, and removals for both growing stock and sawtimber, and for area of commercial forest land during the 1972 Northwestern Ozarks Survey:

Item	*Northwestern Ozarks Unit totals*	*Sampling error (Percent)*
Growing stock:		
Volume	8,590.8 M cords	4.9
Growth	212.1 M cords	6.3
Removals	160.0 M cords	9.2
Sawtimber:		
Volume	1,584.1 MM bd. ft.	6.8
Growth	33.1 MM bd. ft.	9.4
Removals	34.2 MM bd. ft.	8.2
Commercial forest land	1,920.0 M acres	2.4

As survey data are broken down into units smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for area of commercial forest land in a particular county is higher than that for total commercial forest area in the Survey Unit. An approximation of the increasing sampling error can be obtained from table 53, which shows the sampling errors associated with estimates smaller

Table 53.--*Sampling errors*[1/] *for estimates smaller than unit totals of volume, net growth, and removals, and of area of commercial forest land, Northwestern Ozarks, Missouri, 1972*

Sampling error (percent)	Commercial forest	Growing Stock			Sawtimber		
		Inventory	Growth	Removals	Inventory	Growth	Removals
	Thousand acres	Thousand cords			Million board feet		
1	12,400.9						
2	3,100.2						
3	1,377.9						
4	775.1	14,790.0			5,113.8		
5	496.0	9,465.6	371.0	545.6	3,272.8	131.6	92.2
10	124.0	2,366.4	92.7	136.7	818.2	32.9	23.1
15	55.1	1,051.7	41.2	60.8	363.6	14.6	10.2
20	31.0	591.6	23.2	34.2	204.6	8.2	5.8
25	19.8	378.6	14.8	21.5	130.9	5.3	3.7
50	5.0	94.7	3.7	5.1	32.7	1.3	.9
100	1.2	23.7	.9	1.3	8.2	.3	.2

1/ At the 68-percent probability level.

than totals in the Northwestern Ozarks Unit.

SURVEY PROCEDURE

The major steps in the survey of the Northwestern Ozarks Unit were as follows:

1. A total of 24,506 1-acre points distributed systematically across aerial photos of the entire area were observed. These points were classified as either forest land (12,192) or nonforest land (12,314) in order to make a preliminary estimate of forest area. Next, 4,609 of the forest points were stereoclassified as to forest type, stand-size class, and density. Then 449 points classed as forest and 452 points classed as nonforest were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken. Some of the points examined were locations of permanent sample plots (each of which contained one variable-radius plot with basal area factor five) established during the 1959 survey. Of the 345 points determined to be on commercial forest land from ground examination, 195 were at previously unsampled locations and 10-point variable-radius plots (basal area factor 37.5) were established uniformly over the sample acre. The remaining 150 points were at formerly established permanent plot locations and were remeasured by superimposing 10-point variable-radius plots (basal area factor 37.5) over the existing plot in addition to remeasuring the basal area factor five plot. Tree measurements made on new and remeasured plots were the basis for estimates of timber volume, growth, mortality, number of trees, and other forest classifications.

2. Statistics on timber utilization in 1969 were obtained from mill surveys and from remeasurement of permanent sample plots. The Missouri Department of Conservation conducted a canvass of resident sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed resident pulpmills, and the underground mining industry in Missouri, as well as out-of-State sawmills, pulpmills, and veneer mills to determine their use of timber from Missouri. Fuelwood and fencepost output was based on U.S. Census of Agriculture and Housing figures, a canvass of public and industrial timber owners, and a canvass of resident wood-treating plants. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Missouri primary wood-using plants. Timber cut for products by owner class was determined by a canvass of all public and industrial timber owners. The portion of timber cut unaccounted for by the latter owners was grouped under "farmer and other owners."

3. To develop wood utilization factors used in converting timber products output to timber removals for saw logs, veneer logs, cooperage logs, pulpwood, and charcoal wood, 486 felled trees throughout the State were measured. Factors for all other products were obtained during the 1959-1960 Missouri utilization study.

4. Field data were sent to St. Paul where they were edited, punched on cards and stored on magnetic tape for later machine sorting, computing, and tabulation.

ALLOWABLE CUT

Allowable cut is the estimated volume of timber on commercial forest land that could be cut annually for the next 10 years, while improving tree stocking and bringing about a more even distribution of age classes. In Missouri, annual allowable cut is shown separately as that from harvest cutting and from thinnings, and was determined by computer using an area control system for determining the number of acres to be cut annually.

The harvest cut of sawtimber was calculated from stands of forest types normally managed for sawtimber whose site index and age indicated they were ready for harvest, or would be within the next 10 years. Table 54 shows the site index used in these calculations for each forest type to determine whether the objective of management would be to grow sawtimber or pulpwood. Included also is the rotation age for each.

Stands that did not qualify for harvest during that period were checked to see if they were overstocked by basal-area standards, or would be within the next 10 years. Stands determined to be overstocked were "thinned" by the computer back to their recommended basal-area stocking level, and the volume of sawtimber trees "thinned" was added to the volume of allowable cut by thinnings of growing stock and sawtimber. The volume

Table 54.--*Forest type, site index, and rotation age, by management objective, used in calculation of annual allowable cut, Missouri, 1972*

Forest type	Site index	Rotation age	Management objective
		Years	
Shortleaf pine	50 or higher	60	Sawtimber
	Less than 50	40	Pulpwood
Shortleaf pine-oak	60 or higher	80	Sawtimber
	Less than 60	50	Pulpwood
Eastern redcedar	35 or higher	55	Sawtimber
	Less than 35	70	Sawtimber
Eastern recedar-hardwood	45 or higher	50	Sawtimber
	Less than 45	60	Sawtimber
Black-scarlet oak	60 or higher	80	Sawtimber
	Less than 60	50	Pulpwood
White oak	60 or higher	80	Sawtimber
	Less than 60	50	Pulpwood
Post-blackjack oak	All sites	50	Pulpwood
Oak-gum-cypress	All sites	60	Sawtimber
Cottonwood	All sites	30	Sawtimber
Elm-ash-cottonwood	All sites	50	Sawtimber
Maple-beech	All sites	90	Sawtimber

of poletimber trees "thinned" was added to the growing-stock allowable cut by thinnings. In scheduling thinnings, the computer program first "removes" rough and rotten trees, then short-log trees, and finally, growing-stock trees. The volume of allowable cut from rough, rotten, and short-log (rough) trees is kept separate from that from growing-stock trees.

The harvest cut of growing stock included that of sawtimber in addition to the volume from stands of forest types normally managed for pulpwood that were or would be rotation age within the next 10 years.

Allowable cut is based on the assumptions that all timber will be available and accessible when needed, and that a ready market will exist for every species, size, and grade of material harvested. Further, it assumes that the proper sequence of cutting is known and will be followed, and that logging practices employed will result in an improved forest. Because there is no way of guaranteeing that these assumptions will be carried out during the next 10 years, the allowable cut estimates should be compared with timber removals figures only in a general way.

LOG GRADE

In the Northwestern Ozarks Unit the butt log of every sawtimber tree (660 trees) on every permanent sample plot was log-graded. Additionally, all of the logs in a smaller sample of trees throughout the State (265 trees) were log-graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire Unit.

Logs are graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber and How To Use Them" published by the Forest Products Laboratory under the designation D1737A, 1961, and USDA Forest Service standards for hardwood tie and timber logs. The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded.

Shortleaf pine was graded according to "Interim Southern Pine Log Grades," USDA Forest Service, 1953. All other softwoods were graded according to "Specifications for Log Grades of Hardwoods and Softwoods," Northern Hemlock and Hardwood Association, 1947. The lowest 16-foot log in softwood trees or a shorter log down to 12 feet if a 16-foot butt log was not present, was graded.

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Added WON9-3-75

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Pulpwood production in the Lake States by county, 1972, by James E. Blyth. USDA For. Serv. Res. Note NC-152, 4 p. 1973.

Vasilevsky, Alexander, and Burton L. Essex.
1974. Timber resource of Missouri's Northwestern Ozarks, 1972. North Cent. For. Exp. Stn., St. Paul, Minn. 59 p. (USDA For. Serv. Resour. Bull. NC-22)

The third timber inventory of Missouri's Northwestern Ozarks Forest Survey Unit shows substantial gains in both growing-stock and sawtimber volumes between 1959 and 1972. The area of commercial forests declined during the same period. Presented are highlights and statistics on forest area and timber volume, growth, mortality, ownership and use in 1972.

OXFORD: 524.1:905.2(778). KEY WORDS: Timber volume, growth, utilization, forest areas.

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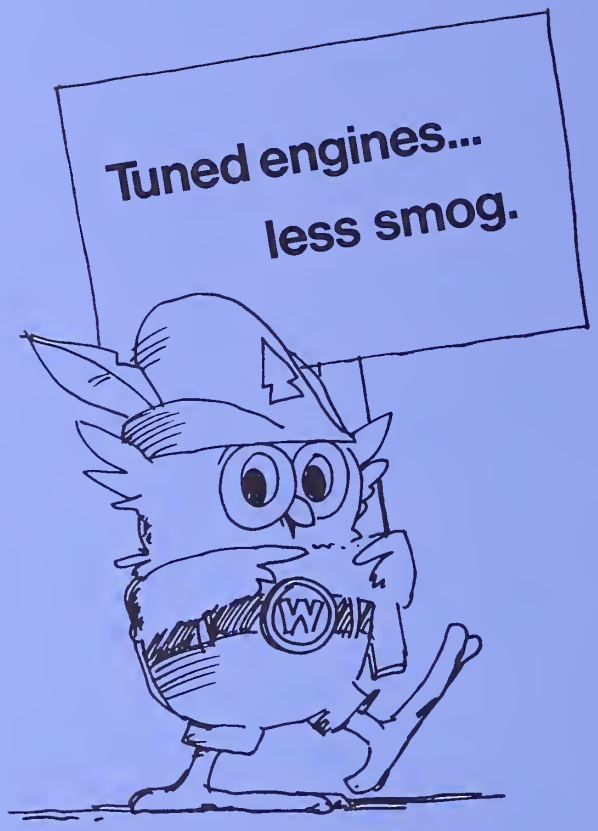
Tuned engines...
less smog.